REPORT

ON THE

CATTLE PLAGUE,

OR

RINDERPEST.



PRESENTED TO THE THREE NATIONAL AGRICULTURAL SOCIETIES OF ENGLAND, SCOTLAND, AND IRELAND.

BY

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REPORT.

Epizöotic diseases, and particularly those which have prevailed among cattle and sheep, have in all ages excited much attention, and taxed the pen of the faithful historian, as well as the cultivator of the science of medicine, to record their successive outbreaks and devastating effects. It is not, however, our intention in this report to follow, even in a succinct manner, the account which has been given of these diseases, extending, as it does, from the period of the infliction of "a grievous murrain" of "boils and blains" on the cattle of Egypt, as a Divine punishment to the obdurate Pharaoh for resisting the command to let the Children of Israel go, down to our own times, but to record the result of our investigations into the nature and consequences of the disease which recently seemed to threaten to invade our shores. Whether "the murrain" that fell upon the cattle of the Egyptians has been permitted in an altered or mitigated form to remain as a scourge to succeeding nations is a problem which cannot, we opine, be satisfactorily solved by any supposed resemblance which our present cattle plagues may bear to the one described by the Sacred historian. This fearful and miraculous visitation must be regarded as the chief of these scourges, however destructive they may since have been.

In the times of the ancient Greeks and Romans the outbreaks of these diseases were not unfrequent, and numerous records of them are left by Homer, Plutarch, Virgil, and others. Columella, at about the commencement of the Christian era, speaks of them as contagious maladies; and Vegetius, in the fourth century, treats largely of their contagious properties, and recommends that the diseased animals should, "with all diligence and care, be separated from the herd, and put apart by themselves." Fracastorius and Weierus also describe the sad effects of one of these visitations in 810, when it is said that the greater part of the cattle perished throughout the Emperor Charlemagne's dominions.

The first recorded instance, however, which we find of the cattle in England being affected by one of this class of maladies is in 1713-14, at which period an epizöotic, that for a

few years previously had prevailed in several continental states, suddenly broke out here, and swept off many of our cattle. No account sufficiently explicit upon the nature and progress of the disease has been handed down to us, so that it is difficult to speak with certainty of its true character, and much more either of its duration or the amount of loss which the country sustained. It appears, however, that the malady possessed many of the features of *Eczema epizöotica*, now common among us, and it may possibly have been identical with this disease. The infection seems to have been communicated by the saliva, as it is said that "when this is dropped on the grass, and sound animals are immediately placed on the same pasture, they contract the disorder; and in some bullocks the tongue was inflamed and covered with many red blisters."

This malady was succeeded in 1744 by one of far greater importance, because attended with a far greater fatality. The disease in question early attracted the attention of the Government of the day, who promptly adopted vigorous means of arresting its progress. It is asserted that the malady first appeared in the neighbourhood of London, whence it extended over the length and breadth of the land, destroying hundreds of thousands of cattle, and continuing its devastating effects with almost unmitigated severity down to 1754-5. Its introduction here has been differently accounted for; but it is pretty generally attributed to the importation of two calves from Holland by a farmer residing at Poplar, with a view of improving his breed, and in whose systems the disease was incubated.

Dr. Layard, in his Essay on this disease, says, however, that an opinion prevailed that it was brought over by an English tanner, who had purchased "a parcel of distempered hides in Zealand very cheap, because they were forbidden to be sold there, and should have been buried." It seems, therefore, to have been confidently believed at the time that the disease was an imported one—a circumstance of much practical value, now that we are receiving several hundreds of cattle week by week from the Continent; although, as this Report will hereafter show, our own investigations have proved that no fear need be entertained at present of "the great cattle murrain" visiting our shores. Notwithstanding the deep and painful interest which the disease excited, and the efforts made by the Govenment to stay its ravages, no correct estimate can be formed of the numbers of cattle which were lost to the country from its duration and extension; but it was ascertained by one of the Com-

missioners appointed by the Government, that in Nottinghamshire alone 40,000 head of cattle perished in six months, and in Cheshire upwards of 30,000 in the same space of time.

By a special Act of Parliament, the King in Council was empowered to issue such orders as were deemed the most effective to arrest the progress of the pest.

Instructions were thereupon given,

1st. For the killing of all the infected animals, and burying them entire with their skins on, "slashed from head to tail," that they might not be used for the purpose of the manufacturer.

2d. For the burning of all the hay and straw used about the animals.

3d. For the cleaning and fumigating the sheds, &c., and for no sound cattle to be put in them for two months after the removal of the diseased.

4th. For no recovered animal to be allowed to go near others for a month after its convalescence.

5th. For no diseased cattle to be driven to fairs or markets, nor for the flesh to be used as food for dogs, &c.

6th. For no *healthy* cattle to be removed from a farm where the disease had prevailed in less than a month after its disappearance.

And, lastly, orders were issued for the notice of an outbreak to be immediately sent by the farmers to either the constables, churchwardens, overseers, or the special inspectors appointed by the magistrates acting for the parish or district. The Government also undertook to pay forty shillings for every ox, bull, or cow which was killed, and ten shillings for every calf, with a corresponding price for their skins.

Mr. Youatt, in his account of the disease, as published in the work entitled 'Cattle,' says, "Of the propriety of this bonus for the destruction of infected cattle there cannot be a doubt, for there were numerous instances in which those who began to kill the sick as soon as the distemper appeared among their cattle, lost very few; but others, who would kill none until their own folly had made them wiser, did not save more than one out of ten."

Many difficulties were thrown in the way of carrying out the Governmental instructions, and not a few impositions were practised by some designing persons claiming the award for old and worn-out animals, as well as for those which were suffering from totally different diseases. In this day, now that veterinary surgeons are practising in every part of the country,

such frauds would scarcely be attempted; and we believe, in the event of occasion requiring it, that a system of inspection, comparatively inexpensive, might be devised which would effectually prevent any instances of the kind.

It is further recorded that in one year—the third of the existence of the disease—£135,000 was paid out of the Treasury as a recompense for the cattle killed according to the prescribed orders, and that during the same year 80,000 head of cattle were killed, and nearly double that number died from the disease. To meet this alarming state of things, and the difficulties which sprung out of the adoption of the measures of the Government, various other Orders of Council were promulgated, and in the *third* order we find that *no* cattle, fat or lean, would be suffered to pass the Humber and the Trent northward from its date, namely, January 19th, 1747, to the 27th of the following March, the object evidently being to protect the cattle in the northern counties by cutting off all direct communication between them and the infected districts for two months.

Newby, in an appendix to his work on mangel-wurzel, states that the cattle-fair at Barnet had its origin in the existence of this disease. "The fair," he says, "was formerly kept at Islington, till the distemper, which raged violently among the cows at that place in 1746, obliged the Welshmen to remove to Barnet, where it has been continued ever since."

Great as were the losses, no reasonable doubt can be entertained that they would have been very much augmented had not the Government taken the course it did; and we also fear that the continuance of the disease would have been extended over a far greater number of years than it was. The attempts at cure were not satisfactory, and very little appears to have been known of the true nature of the malady even by those members of the medical profession who gave attention to it, for at that time there were no scientifically educated veterinary practitioners. After a careful perusal and analysation of the writings of the different physicians who have treated of the subject, we believe that we are justified in saying that the malady was identical with that which has recently excited so much fear and alarm in the public mind, as being likely to be introduced from the Continent.

From the period of a subsidence both in the amount and virulence of this cattle-pest in 1754-5, until its final departure a few years afterwards, England appears to have been singularly exempt from epizöotic diseases, and to have remained so down to August, 1839, when great anxiety was

created by the sudden and almost simultaneous appearance of a "new affection" (although probably of the same nature as that of 1713-14) among the cattle in different parts of the country. The earliest accounts which we received of the outbreak came from Norfolk, and there seems no reason to doubt that it was here that the disease was first observed. Cattle of all ages and under every variety of system of feeding and management became the subjects of the malady, which was recognised by the existence of vesicles upon the upper surface of the tongue, inside the lips, and on the dental pad. Vesicles were also formed between the digits, and occasionally upon the teats and udders of the cows. The existence of these vesicles was associated with a discharge of viscid saliva from the mouth, loathing of food, imperfect mastication, suspension of rumination, loss of milk, a tenderness in walking, and general symptoms of febrile action.

The malady was not confined to cattle, but sheep, pigs, and domestic poultry, of the gallinaceous tribe, were likewise its subjects. By common consent it was designated the cattle epidemic, but has since been scientifically known as *Eczema epizöotica*, or popularly as "the mouth and foot disease." It has continued from that time to the present, not proving on the whole a destructive disease to life, but at irregular intervals assuming a more severe form than ordinary, particularly in 1845 and 1852, and leading on these occasions to a great deterioration in the value of the animals affected.

Shortly after the appearance of eczema, namely, in 1841, pleuro-pneumonia broke out among the cattle, and it, too, has remained down to the present time. It is worthy of a passing remark that neither of these were imported diseases. It was not until several months after pleuro-pneumonia had established itself in the country that an alteration took place in the tariff, by which live stock came in free of duty, and up to that time the high rate of duty prevented any importations of foreign cattle or sheep being made. This fact in itself is sufficient to prove that the malady was not imported by foreign cattle; besides which, the parts of the country where it was first observed could not possibly have had any immediate or direct communication with the ports. Pleuro-pneumonia had no sooner gained a footing, than, following the law of all epizöotics, it quickly spread over a great breadth of country, and continued to devastate our herds with almost unmitigated severity for the first few years. It has since taken on rather an enzöotic form, and has prevailed mostly in such localities and places where

secondary causes are in full operation to predispose animals to its influence; hence its continuance in the ill-ventilated, over-crowded, and badly-drained cow-sheds of the metropolis and other large towns, and on the "cold retentive soils" and undrained farms in the country, especially such as lie in exposed situations.

Besides the special cause, or rather, perhaps, special combination of causes, which give origin to the enzöotic form of pleuro-pneumonia, its appearance in a cattle-shed, or on a farm, is frequently traceable to the introduction of newly purchased animals, who bring the disease in a latent state with them; and which, on its declaring itself, extends by ordinary infection to those with whom they are located. Infection we hold to be one of the chief causes of the continuance of pleuro-pneumonia for so many years among us, as every diseased animal, by virtue of the exhalations given off from its body, becomes a focus of the malady, and a new source, whence the poison, so to speak, is disseminated. The same fatality which marks the progress of pleuro-pneumonia here, attends it everywhere; and throughout the Continent it is looked upon as an incurable disease, and dealt with accordingly. Its great fatality arises from the circumstance that the nature of the changes which take place in the lungs is such as immediately to arrest their functions as perfect aërifying organs, and soon to destroy, to a greater or less extent, the integrity of their structure. The true pathology of pleuro-pneumonia is among the *questiones vexatæ* of science. In this report we have not immediately to do with this question, still we may observe that the most eminent professors of veterinary medicine throughout Europe hesitate to declare, as some medical practitioners have done, and others also who have probably given but little thought to the subject, that the changes wrought in the lungs are altogether due to inflammatory action.

In Belgium, in France, and in many parts of Italy, the disease is designated *exudative* pleuro-pneumonia—a name which, while it marks a peculiarity in the disease, implies, that it differs somewhat in its results from ordinary inflammation of the lungs and their investing membrane, and which is correctly called pleuro-pneumonia. We have no hesitation in giving it as our opinion that the changes which are *originally* effected in the lung-tissue can take place otherwise than by inflammatory action. We observe, as the analogue of these changes, that in the advancement of the disease, the interstitial areolar tissue contiguous to the more affected parts of the organs, becomes primarily choked with

serous effusion, which by its pressure upon the air-cells and their rete of capillary vessels, obstructs both the admission of air to the cells, and the circulation of the blood through the vessels, and thus leads to an imperfect decarbonization of the blood, as well to far more important changes in the fluid itself. Not only, in many diseases, are serous exudations entirely independent of inflammation, but fibrinous ones are equally so in the opinion of some of the ablest pathologists of the present day. These deposits may result from the vital force of the vessels being impaired by some depressive influence acting on the nervous system, either generally or locally, as well as by some unexplained or ill-understood alteration taking place in the composition of the blood, from the existence within it of morbific animal or vegetable products. The fibrinous depositions in pleuro-pneumonia succeed the serous, and are probably due to either an alteration in the relative proportion of the component parts of the blood, or an interference with its vitality, brought about by the presence of the special *materies morbi* of the disease, and which may have entered it in the ordinary manner of infection. The abnormal action which commenced in the parenchyma of the lungs extends towards their investing membrane, when, from the nature of this tissue, as well as from the longer existence of the action itself, an augmented fibrinous exudation takes place upon the surface of the organs. We regard, therefore, the implication of the pleura as a characteristic of an advanced stage of the malady, and also of a still further deterioration of the blood.

Since the appearance of pleuro-pneumonia no other disease of a fatal character, and possessing contagious or epizöotic properties, has shown itself among our cattle; but in 1847 a very fatal malady broke out among sheep. This affection was recognised as the smallpox of the sheep, and it was ascertained in the most conclusive manner that it had been introduced here by some "Merinos," which had been shipped at Tonning, on the coast of Denmark, and also by some others shipped at about the same time at Hamburg for the supply of the English market, and in whose systems the disease was incubated. From the free commingling of these foreign sheep with our own breeds in the London Cattle Market, and also from the circumstance that many of them were purchased by farmers as "stock sheep," the smallpox was soon spread over a great tract of country, proving destructive to life in numerous instances to the extent of even 90 per cent.

This state of things was met by legislative enactments, with the view to arrest the progress of the malady, and hap-

pily they proved of essential service in so doing. By the expiration of the third year from the outbreak, scarcely an instance of the disease could be met with in any part of the country, and this notwithstanding tens of thousands of animals were, to our own knowledge, affected in the year succeeding its introduction. From the time of its subsidence in 1850 until now, we have been perfectly exempt from cases of sheep pox.

This short historical account of epizöotic affections of cattle, in this country, brings us down to the present period, and to the especial subject of this report.

It was during the latter part of the past year that the public mind became much excited by frequent and almost continuous reports that a malady of a most fatal description had shown itself among the cattle on the Continent, and that it was rapidly extending towards those countries whence we received our chief importations. In the early part of the present year, the subject assumed so much practical importance, that the attention of Parliament was directed to it on two or three different occasions. Her Majesty's Government, it was found on inquiry, had early given instructions for our Consuls abroad to collect all the information they possibly could in their several localities, and to transmit the particulars of their investigations without delay to the Minister of Foreign Affairs. These despatches were from time to time forwarded by Lord Clarendon to the Council of the Royal Agricultural Society, who also had from the beginning taken the liveliest interest in the matter, and who lost no opportunity of placing the latest information before the country through the weekly publication of their proceedings. The official documents, however, in no way tended to allay public apprehensions, but rather, on the contrary, to increase them, as it was distinctly stated that the "murrain" was rapidly making its way westward from the countries where it had been first observed, and that it would ere long be introduced here unless the greatest caution was exercised in regulating our supply of foreign cattle; and that even then it was more than probable the disease would come in, for experience had proved that it could be carried from place to place by skins, hoofs, or horns, or indeed anything which had been exposed to the infection by being brought near to the diseased animals.

Notwithstanding the great amount of information which was supplied by our Consuls, but very little of a satisfactory kind could be obtained with reference to the true pathology of the disease. The Council of the Royal Agricultural Society therefore felt that under such circumstances as these

some more decisive step should be taken and this opinion found a ready response in the other two National Agricultural Societies of Scotland and Ireland. At this juncture a communication was received from the Royal Agricultural Improvement Society of Ireland, suggesting "that it would be desirable for the three agricultural societies of the United Kingdom to join in the common object of despatching abroad a special veterinary inspector, for the purpose of ascertaining the exact nature of the contagious typhus."

At a meeting of the Council, held on the 1st of April, some further communications were read from Mr. Hall Maxwell, C.B., Secretary of the Highland and Agricultural Society of Scotland, and from Captain Croker, Secretary of the Royal Agricultural Improvement Society of Ireland, expressing their willingness to concur with the Royal Agricultural Society in making arrangements for despatching a veterinary inspector to the districts abroad where the cattle-murrain was at present raging. The Council thereupon agreed to the following resolution:

"That it is expedient to send a competent veterinary professor to examine into the nature of the cattle-murrain on the Continent. That the Society gladly accepts the co-operation of the Highland and Agricultural Society of Scotland and the Royal Agricultural Improvement Society of Ireland, in this step. The society ventures to recommend that Professor Simonds, of the Royal Veterinary College, be commissioned to this task. That he be empowered to take with him a German veterinary surgeon, established in London, quite competent for the business, and who would smooth the difficulties of the German language. It is supposed that about three weeks would be required for a satisfactory examination. That the Highland and Agricultural Society of Scotland be informed that the Royal Agricultural Improvement Society of Ireland propose to share the expense of this mission with the Royal Agricultural Society of England; and that they be asked to join in the same manner."

It is scarcely necessary to say that the national societies of Scotland and Ireland most readily consented to the proposition contained in this resolution; and on the Government being informed of the step about to be taken, Lord Clarendon kindly forwarded the subjoined letter of introduction to the British Consuls to me, through the Secretary of the Society, accompanied with the following communication:

"Foreign Office; *April* 4, 1857.

"Sir,—I am directed by the Earl of Clarendon to acknowledge the receipt of your letter of the 2d instant, acquainting his lordship with the intention of the Council of the Royal Agricultural Society of England, in conjunction with the Societies of Scotland and Ireland, to send Professor Simonds to those districts abroad where the disease among cattle is at present raging; and I am to enclose a letter which has been addressed, by

Lord Clarendon's directions, to the British consular agents in Northern and Central Europe, instructing them to afford to Professor Simonds all the assistance in their power in carrying out the objects of his mission.

"I am, sir,

"Your most obedient, humble servant,

"E. HAMMOND.

"James Hudson, Esq."

(*Enclosure.*)

"FOREIGN OFFICE; *April* 4, 1857.

"SIR,—I am directed by the Earl of Clarendon to acquaint you that the Council of the Royal Agricultural Society of this country have notified to his lordship their intention, in conjunction with the Agricultural Societies of Scotland and Ireland, to send a veterinary professor to the districts abroad where the disease among cattle is at present raging, and that the Committee have selected Professor Simonds for this service. I am, therefore, to instruct you, in the event of Professor Simonds visiting any part of your district in the course of his mission, to show him every attention, and to afford him all the assistance in your power in carrying out the objects of the Societies by whom he has been appointed.

"I am, sir,

"Your most obedient, humble servant,

"E. HAMMOND.

"To the British Consular Agents in Northern and Central Europe."

The first step, according to my instructions, being to secure the services of a veterinary surgeon familiar with the German language, I at once called on Mr. William Ernes, M.R.C.V.S., a gentleman eminently fitted for the task; and who, besides being a native of Belgium, had had the great advantage of travelling almost throughout Europe, thus becoming practically acquainted with most of the continental languages. Mr. Ernes had also received an English medical education, and his tastes were in full accordance with the objects of the mission.

Having secured his co-operation, we left London for Belgium on the morning of April 9th, and arrived the same evening at Ghent.

We deemed it expedient to ascertain, with as little delay as possible, the state of the health of the cattle in those countries whence we were receiving our daily supplies, and also the details of the system which prevailed with regard to the cattle trade, together with the particulars relating to the shipment of animals to England. This part of our mission was the more pressing as the recent Order in Council, prohibiting the importation into the United Kingdom of "cattle, or of horns, hoofs, or hides, from those territories of Russia, Prussia, or Mecklenburgh-Schwerin, which lie in the Gulf of Finland,

or between the Gulf and the city of Lübeck," might be found to require an immediate extension to other countries, or possibly we might ascertain that a relaxation of it could be made without the incurrence of a greater risk of the disease being introduced. We therefore commenced our inquiries in

Belgium.

Our investigations here fully confirmed the statement made by Lord Howard de Walden, her Majesty's ambassador at Brussels, in his despatch to Lord Clarendon, dated March 20th, 1857, that this country was perfectly free from the cattle plague—rinderpest. We found that eczema epizöotica prevailed to some extent, but not in a serious form, and that pleuro-pneumonia also existed in several parts of the kingdom. Rinderpest, however, had not shown itself to an extent to create much solicitude since the Seven Years' War, during which time it destroyed vast numbers of cattle. From 1813 to 1815 some cases occurred in the district between Namur and Luxemberg, and which are said to have depended upon the passage of the Austrian army into France. The route taken by the army was south of the Belgian frontier, and near to the places in question; and it appears that along its whole course the disease was manifested to a greater or less extent on either side of the military road. It is also said that the cattle belonging to the Prussian army being healthy, no disease followed its course through the country, and that thus a great part of Belgium escaped the pest; the measures of sanitary police confining it chiefly to the neighbourhood of Namur, and the districts in which it had manifested itself.

We refrain from commenting on these facts in this place, as hereafter we shall have to call attention to the freedom of continental states in general from the disease, unless infected cattle, or such as have been exposed to the contagious influence of the malady, are introduced therein.

At Ghent we visited a cattle fair which was held the day after our arrival, and had thus an opportunity of observing the general state and condition of animals brought from all parts of the kingdom, and which proved to be most satisfactory. From the cattle-dealers we learned that no difficulties are placed in the way of the passage of cattle to or fro over the frontier, so long as they are healthy, but that restrictions would be rigidly enforced on the breaking out of a contagious disease. Lord Howard de Walden writes that "no law exists under which diseased cattle can be excluded

at the *frontier;* a project of law, with a view to such sanitary precaution, was presented to the Chambers two years ago, but was rejected; and therefore the only resource lies in the activity of the burgomasters in frontier localities, by enforcing the general regulations in regard to animals while within the range of their jurisdiction."

Pleuro-pneumonia has prevailed rather in a sporadic than an epizöotic form for the last two years, and an equal number of cases are said to have occurred in places where the feeding and general management of the animals are unexceptionable, as in those where the opposite state of things obtains, but that, under the latter-named circumstances, the disease has assumed a more fatal character. All animals which are supposed to be affected by this disease have to be reported by the proprietors; and if, on examination by the governmental veterinary surgeon, they are found to be the subjects of it, then an order is given for them to be killed. The skin, horns, and other integumental parts are used, but the flesh is buried as a rule, in accordance with the regulation of the Government, who pay a proportionate amount of the value of the animal, and generally to the extent of one-third.

It appears, however, that this regulation is sometimes evaded, and that the carcases of such animals occasionally find their way into the meat market, but no instance of injury being done to persons eating such flesh is known to have occurred. Many animals also are not officially reported, as the proprietor either sells them for slaughtering or has them killed unknown to the authorities. Should this, however, become known, the animals are seized, and disposed of as the Government sees fit, and a fine is also inflicted on the offender. Upon the whole, the laws of the sanitary police are so strictly enforced, that in the event of the rinderpest extending into Belgium, it seems scarcely possible for animals which *had even been exposed* to its infection to be exported from the country.

At Antwerp, we ascertained that the chief exports of animals to England from thence are calves, and that the major part of the cows and oxen which are fatted for the market are sent into France, where at this time a better price is obtained for them than in England. The calves are purchased of the farmers in different parts of Belgium by commissioned agents, who collect them together for shipment from Antwerp, but some of the oxen come direct from Holland. The proportionate amount of oxen to calves which are ordinarily exported, is shown by a return furnished

by MM. Vandenbergh for the year 1856. The MM. Vandenbergh are the largest shippers of cattle to England; and although a few animals are sent over by other companies, they are in about the same proportion. The return shows that 2020 calves were forwarded here in the year, but only ten oxen.

Holland.

As this country sends our principal supply of foreign cattle and sheep, it became the more important to ascertain their freedom, or otherwise, from contagious diseases. With the exception of pleuro-pneumonia and eczema, no other affection prevails among the cattle. Rinderpest has had no existence for upwards of forty years, and is unknown even to the veterinary profession, except by name. The parts of the country most affected with pleuro-pneumonia at this time are North Holland and Friesland.

By a statistical return from forty-three villages in North Holland and Friesland, it is shown that only eight of them have been comparatively free from pleuro-pneumonia, and in these but very few cattle are kept. In the villages where the disease has prevailed, about a fifth part only of the cattle-owners have escaped upon the whole, but in many, every proprietor has had his herd affected. In the first quarter of the present year the official returns show a total loss of 3655 head of cattle, of which 1502 died, and 2153 were killed by order of the authorities, which gives an average loss of about 281 per week.

We are not surprised at the great extent of these losses, judging from what we saw of the secondary causes of epizöotics in operation in the vicinity of Rotterdam. The cattle are often crowded into houses so thickly, that to pass between them is almost an impossibility. The form and size of the building also will frequently allow of a passage only to be made by a person along its centre, where the heads of the animals nearly meet over their feeding troughs, while the height of it is generally insufficient to stand upright in. No windows exist in many of these sheds, nor any other inlet for light and air, except the door. The heat is almost suffocating, and the stench abominable. In such unwholesome and pest-breeding places as these, the cattle, often to the extent of forty or fifty in a shed, are kept for weeks together to be fatted for the market, by being fed chiefly on the wash and grains which come from the distilleries.

The cattle which are sent from Friesland are shipped at

Harlingen direct for England, and the numbers put on board there are fully six times greater than at Amsterdam. Friesland is one of the great cattle districts of Holland, and supplies not only the English market with many animals, but other countries likewise. She therefore receives no imports, nor does it appear that any of the vessels conveying cattle from the ports of the Elbe or the Weser, or from any part of the coast of Holstein, ever touch at the Dutch ports, so that a contagious malady like rinderpest, existing in Holstein or in the countries watered by those rivers, would have to make its entrance by way of the land into Holland.

No restrictions are put upon the cattle trade with reference to bringing of animals over the frontier, but all importations of the kind would be immediately prohibited on the appearance of the disease in question in any neighbouring states. The prices obtained for cattle in the English market are not viewed as being sufficiently remunerative just now by the Dutch feeders, and hence the diminished numbers sent here. When the contrary state of things prevailed, many animals were purchased in Prussia by the dealers, and forwarded to the different ports of Holland for exportation: and not a few, it is said, came even from Switzerland down the Rhine for this purpose. These facts show that it is possible for a disease of a malignant kind, which is incubated in the system of an animal for ten days or a fortnight, to be introduced into England from other countries *via* Holland: and, also, how necessary it is that we should be acquainted with what is passing on the continent with regard to diseases in general as affecting cattle, and particularly if belonging to that class which forms the subject of this report.

The continuance of a well-ordered and rigid system of inspection of imported animals on our part will, however, do much to protect us, and that not merely by its leading to the detection of diseased animals on their arrival, but by the effect which it will have upon the export trade of foreign countries. Proof of this is given by the circumstance that last year, when it became known that our Customs' inspectors had received orders to be particularly strict in the examinations of cattle, the General Steam Navigation Company of Rotterdam, unwilling to take the responsibility of the probable rejection of animals committed to their care, appointed a veterinary surgeon to examine them when put on board their boats. This company brings by far the largest proportion of cattle to England, and although this precautionary measure was not adopted by other shipping companies, they nevertheless declared their intention of

having recourse to it, and only refrained from so doing, because of the great diminution which took place in the number of the animals which were shipped. The system of examination was kept in force for about three months, when also, and from the same cause, the General Steam Navigation Company discontinued it. The returns of these examinations, together with the results, were regularly transmitted to the British Consul. Should the prices again rise in England to an extent which would, in the opinion of the cattle feeders, justify them in sending us more animals, then there cannot be a doubt of the re-establishment of this system of inspection.

No duty is chargeable on animals imported into Holland, but an *export* one has to be paid, and which amounts in English money to about the following rate per head, namely, oxen, 10*d.*, calves, 2*d.*, sheep, 2*d.*, lambs, 1*d.*, pigs, 1*d.*, with an additional duty of 13 per cent. on the gross sum.

Although Holland rears immense numbers of cattle, she, for her great export trade in these animals, becomes an importing country for hides, receiving her chief supply of these from Java and Buenos Ayres, with some from England, but none from Russia, so that all fear of the introduction of contagious diseases through the means of skins may cease, in so far as Holland is concerned.

Our investigations led us to visit the cattle feeders, and among others we saw Mynheer A. Poot, who resides within a few miles of Rotterdam. M. Poot ships upon an average 600 animals a year. He informed us that no disease had prevailed in his sheds since February last, prior to which time he had several cases of pleuro-pneumonia. He appeared to be an entire stranger to any other contagious disease, and said that, in the event of an affection like rinderpest breaking out among his stock, a *cordon* would be immediately placed around the farm by the *local* authorities, and that he should be compelled to slaughter the diseased animals and bury them with their skins on in quick-lime. In his opinion it would be an impossibility to export any portion of their carcases to England, even if attempts were made to do so, in consequence of the strictness with which the police sanitary regulations are carried out. He adduced as an instance, that on the first breaking out of pleuro-pneumonia in 1829, and before experience had shown that the flesh could safely be used for food, he and others had to kill the affected cattle and bury them entire, with a view to prevent injury being done to the people, as well as to limit the spread of the malady.

On the question of our Government ordering all imported animals to be slaughtered on their arrival in the docks, and their carcases sent to the meat-market, M. Poot considered that such a step would be tantamount to the stopping of the importations entirely. The boats very rarely, if indeed at any time, are freighted with cattle all belonging to the same person: the cargo is therefore mostly comprised of animals the property of several individuals, and identity of each particular animal, which is necessary for the purposes of trade, could scarcely be made under such circumstances; besides, he said, a necessity would be created for an immediate sale of the meat to the injury of the interests of the persons sending the animals. He was equally opposed to the establishment of a quarantine, and was of opinion that it could not be carried into practice, and England continue to receive full supplies of foreign cattle.

The system at present adopted, is for various feeders to consign their cattle to salesmen in the London market, who, as in the home trade, charge a commission on the sales they effect. As no animals are brought into Rotterdam coastways for re-shipment, all consequently have to pass through the town to reach the vessels, so that they are thus subjected to the general inspection of the local authorities, regulations existing to prevent diseased animals from entering into this and the other towns of Holland. Besides the security thus afforded, it is clearly not in accordance with the interests of the exporters to put diseased cattle on board, as it is impossible for them to bear up against the fatigue of a sea-voyage, or to be on their arrival here in a fit state to pass the scrutiny of our Customs inspectors.

The cattle which are fattened either for the home trade, or for exportation, are purchased at the different fairs and markets in the country, and are for the most part reared in Friesland and Guelderland, scarcely any being brought in from other countries.

Upon the whole, notwithstanding the dangers we have pointed out, the system which prevails generally with regard to the cattle trade, and the additional regulations which would be enforced did necessity arise, appear to offer a fair amount of security against the introduction of a new cattle pest from Holland.

Westphalia and Hanover.

These countries are entirely free from Rinderpest, and have been so for upwards of forty years; and besides which, very little disease of any kind was found to be prevalent

among the cattle. The laws which are enforced with regard to contagious diseases, are analogous to those which are generally adopted upon the Continent, but differ a little in some of their details.

Pleuro-pneumonia was said by the late M. Hausmann, Professor of the Veterinary School, to have been first observed in Hanover, as early as 1807 (?) Be this as it may, the disease has prevailed, with more or less severity, for some years, but of late years the animals attacked have been so few as not to create any great solicitude on the part of the Government. Precautionary measures are, however, adopted on the frontier with regard to cattle coming from Holland, which are made to undergo a quarantine, and none are allowed to enter from Holstein unless they are certified to be in a state of perfect health.

Veterinary surgeons are bound to give notice of all cases of contagious disease which they may meet with in their practice, and proprietors also are required to report the appearance of pleuro-pneumonia or allied affections among their cattle. No animal, although seemingly in perfect health, if it has been living with others affected with pleuro-pneumonia, can be pastured or driven on roads so as to come within two hundred yards of other cattle; nor can the owner dispose of any of his herd under such circumstances, until it is certified by the department veterinary surgeon that all the animals are perfectly free from the disease. The period of time which is allowed to elapse after the passing away of the malady and the selling of the cattle is left to the discretion of the veterinary surgeon. A proprietor can place his animals under medical treatment if he sees fit, or he is at liberty to slaughter them and send them to the meat-market. The flesh of those affected with pleuro-pneumonia, even in its advanced stages, is not unfrequently sold, as in England, by the inferior class of butchers.

A regulation exists with regard to the disease glanders, which, although it does not belong to the special object of this report, may, nevertheless, be mentioned. Horses affected with this malady are not only prevented being sold, or exposed for sale, but the owner is compelled to have them killed; and he is not allowed, under the pain of a heavy penalty, to sell any other horse out of his establishment, or even to place any one of them in stables belonging to other persons, for six months after the death of the affected animal.

M. Hausmann, Veterinary Surgeon to his Majesty the King of Hanover, informed us that a conviction had very recently taken place under this law, where a carrier was

heavily fined for putting his horses, which had been with a glandered animal, into a stable at a public inn in the town of Hanover, on the occasion of his coming to the place on the market day.

Hamburg.

This, as the chief port of the Elbe, receives a considerable number of cattle from the surrounding districts for exportation to England, and large quantities of hides are also sent from hence. Some diminution in the amount of cattle which of late has been shipped at Hamburg has taken place, and from the same cause which is assigned by the exporters from Holland, namely, that the price obtained in the English markets is not sufficiently remunerative, when compared with that which can be procured at home.

The cattle come chiefly from the distillers, sugar refiners, and farmers, in the town and territory of Hamburg, and the adjoining duchies of Holstein and Lauenburg. They are usually sent first to the market at Hamburg, and if not sold, are exported to England. An inspection of them is regularly made in the market by a duly appointed veterinary surgeon; besides which they are prevented entering the town, unless found to be in a healthy state. These regulations afford us a certain amount of security against the importation of diseased animals from this port. The system of inspection has been in operation from the commencement of the recent outbreak of pleuro-pneumonia in Holstein; but it has been particularly observed since September, 1856, when the following proclamation was made by the Senator of the Marshlands of the territory of Hamburg:

Proclamation.

"Hamburg, 19*th September*, 1856.

"It having been communicated to the Senator of the District of the Marshlands that in several parts of the Duchy of Holstein a pulmonary disease has again broken out among the cattle; in order to prevent the introduction of this dangerous malady, it is hereby ordered that for the present no cattle can be brought into the district of the Marshlands from the Duchies of Holstein and Lauenburg, without a certificate from the proper local authorities, stating that, at the places from whence the same may come, no infectious disease prevails among the cattle, and this under a penalty of fifty thalers for every case of contravention.

"The whole of the bailiffs and subordinates are hereby required particularly to attend to this order, and obtain observance of the same, and denounce to the authorities of the Marshlands all who may disobey or attempt to disobey the same.

"(Signed) Arning, Dr.
"Senator for the Marshlands."

No cattle intended for the English market are brought into Hamburg by the ships from Tonning or the other ports on the coast of Denmark, but they go direct from thence to England; nor are many conveyed there for this purpose by means of the navigation of the Elbe from Central Germany. "The Order in Council," at the time of our visit in April, did not appear to be understood by the exporters of cattle as to the intention of the Government with regard to this port; and they refrained at first from shipping cattle, although Hamburg was not named in the prohibition, for fear lest on their arrival in England, they should be seized by the Commissioners of Customs.

We were informed by Colonel Hodges, Consul-General at Hamburg, that a similar doubt existed with regard to hides, and, further, that the order would be inoperative for good, presuming that the seeds of a contagious disease could be conveyed by these articles of commerce so long as Hamburg, as the port of the Elbe, and Bremen, as the port of the Weser, were left open, as large quantities of these commodities come down those rivers. The hides are collected from out of various countries, and it is impossible to trace them to their original source. The merchants of Hamburg, however, continued to export hides, first making a declaration before the Consul that they did not come from Lübeck or any of the Baltic ports. The Consul upon this certified that such declaration had been made, and thus left our Commissioners of Customs to deal with the question as they might see fit. Should the necessity unfortunately arise to prohibit the importation of cattle, hides, hoofs, &c., from the fear of introducing a contagious disease, such as the rinderpest, then not only must Bremen and Hamburg be named in the order, but Tonning also, as the port of the Eider, as this place has direct water communication with the port of Kiel on the Baltic, from which place hides, hoofs, &c., can readily be conveyed.

Little fear, however, need be entertained of the introduction of the disease from Denmark by means of any cattle which she might receive from the Baltic ports. The difficulties in the way of a *direct* trade of this kind are too great for it to be carried on with facility or advantage. Such cattle would have to make the port of Kiel, and be then disembarked, in order to be placed on the vessels navigating the canal which connects Kiel with the Eider, and on reaching Tonning, be again re-embarked on vessels bound for England.

Denmark, Schleswig, and Holstein.

In September last, it was officially communicated to the Government by Vice-Consul Blackwell, of Lübeck, that "the *steppe murrain of Russia had made its way into Holstein*, having passed through Poland, Prussia, and Mecklenburg." We ascertained, however, that this disease has had no existence in this part of Europe since the occasion of its last general outbreak in 1813. It is also recorded, that up to that time the affection had not prevailed in the Duchies since 1774 to 1781, when 150,000 head of cattle are said to have perished.

Pleuro-pneumonia is rife in Holstein, particularly in the neighbourhood of Altona, where an active cattle trade is carried on. The malady is said originally to have appeared here in 1842, or nearly about the same time it was first observed in England. At the commencement of 1843, Herr Rottger, district veterinary surgeon of Altona, received orders from the Danish Government to watch the progress of the disease. No active means to limit its extension were, however, had recourse to, until 1845, when the Government sent Professor Witt, of Copenhagen, to investigate the matter. Professor Witt and Herr Rottger, with a surgeon and the Government veterinary surgeon of Hamburg, formed a sanitary commission of inquiry. The commission came to the conclusion that the disease was highly contagious, and recommended the Government to adopt the most stringent measures of prevention. These consist in chief of—

a. Sequestration of the places where the disease is found to exist.

b. The immediate slaughter of the infected animals.

c. The killing of the whole herd upon the occurrence of fresh cases.

d. The burial of the diseased cattle with their skins on, cut in such a manner as to prevent their being surreptitiously disposed of, and the sprinkling the body over with chloride of lime.

The indemnity consists in the Government paying two-thirds of the value of the diseased animals, and the full value of the healthy, the loss to the treasury being partly provided for by the Government selling by public auction the carcases of the animals which are free from disease.

For the carrying out of these regulations, it is ordered, among other things, that every proprietor of cattle shall, upon the outbreak of a disease which seems to possess some unusual features, give notice to the district veterinary sur-

geon, or be subjected to a fine varying from fifty to a hundred thalers. The veterinary surgeon has to report the result of his examination to the police, and if it should prove that the malady is a contagious one, then the regulations are strictly enforced. The animals are valued on the part of the Government, and branded on the horns for the purpose of identity. Should no other cases occur after the diseased animals are killed, the proprietor is still prevented selling any of those which had been exposed to the contagion, and which bear the Government stamp, in a less period of time than six months, and only then with a certificate from the veterinary surgeon that they are free from disease.

The adoption of these severe measures led, it is believed, to the nearly total extinction of pleuro-pneumonia in two or three years. In 1847, however, it again prevailed in Holstein, also commencing, it is said, in the neighbourhood of Altona. In 1849 and 1851, other outbreaks occurred, the disease extending on the latter occasion into Schleswig and Denmark Proper, but was quickly suppressed by the severity with which the law was executed.

The outbreak from which the country is at present suffering, took place in the spring of 1856. It is attributed to the circumstance of two gentlemen of Hamburg purchasing in Hungary 180 oxen, and sending them to graze on the islands and marshlands of the Elbe. The disease manifested itself in these animals, and from them it was communicated to some cows which were sent daily from the town of Hamburg to graze in the same pastures, and was thus spread over the territory and the adjacent portions of Holstein. This called for the re-adoption of the preventive measures previously alluded to, and which are still in operation in the Duchies, but modified to some considerable extent in the town and territory of Hamburg.

The almost simultaneous appearance of pleuro-pneumonia in Mecklenburg, which is said to have depended on the introduction of some cattle from Bavaria, together with its existence in several of the German States, led the Government to issue the following order with reference to the importation of cattle into Holstein and Lauenburg.

"COPENHAGEN, *June 18th*, 1856.

"PROCLAMATION for the DUCHIES of HOLSTEIN and LAUENBURG, in reference to the IMPORTATION of HORNED CATTLE from abroad.

"Whereas, according to official information, the pulmonary epidemic has shown itself again in horned cattle in several German States, the importation of horned cattle from abroad will not, until further notice, be permitted

into the Duchies of Holstein and Lauenburg, unless satisfactory certificates, issued by authority, be handed in at the same time, stating the place from whence the cattle have been brought, and that in such place no signs of the pulmonary epidemic have appeared for more than six months; the cattle being therein described as accurately as possible.

"The above is hereby made known for the information and guidance of those who receive it; and at the same time the police authorities are especially directed to see the strict observance of the above order.

"Royal Ministerial Department for the Duchies of Holstein and Lauenburg, 9th June, 1856.

(Signed) "V. Scheele.
"G. Harbou."

Pleuro-pneumonia, however, continued to prevail in Holstein, despite all measures, preeautionary or otherwise, which were had recourse to, and this led the Minister to issue new regulations during last year, to stay, if possible, its further progress. It was thereupon ordered that "*all estates* (farms) *in which cases of pulmonary disease have occurred within the last six months, are to be closed, and no removal of cattle from such estates is to be permitted. The cattle are to remain as much as possible in the same stalls, and only to be removed to the pasture grounds of the owners, which are to be fenced round to the exclusion of all other cattle, as it is deemed necessary to remove cattle from their infected stalls to purer air.*"

In July, 1856, Schleswig placed the importations into her territory from Holstein under restrictions; but as these also proved to be insufficient, the Minister of this Duchy, in March of the present year, forbade the importations entirely.

In August, 1856, Denmark, by the Minister of the Interior, likewise ordered that no cattle would be permitted to enter the kingdom from Holstein, unless they were accompanied by a certificate of a veterinary surgeon, stating that they were in good health when exported, and also by the certificate of a magistrate, that the district from which they came was free from disease. And in September following, proclamation was made to a similar effect by "the Senator of the District of the Marshland of Hamburg," a copy of which has been given above.

This succinct history of the proceedings of foreign governments, enables us to trace to their probable origin those restrictive laws which have created so great solicitude in England. We could hardly have supposed that such severe measures would have had the support of scientific men, and more especially in their exclusive application to a disease, whether contagious or not, the antecedents of whose history show that it often passes from country to country as an ordinary epizootic affection

Without wishing to animadvert on the opinions of others, we hold that an equal amount of good would attend measures far less stringent; and, if this be so, then a positive injury is inflicted on the country where they are enacted. Take, as one illustration, the quantity of food which is lost to the people by the burying of animals in whose system the malady has made but little progress. We are exceedingly jealous lest any observation of ours should be supposed to give encouragement to the sale of diseased meat; but, after fifteen years' experience of pleuro-pneumonia in this country, and of the sale of the carcases of animals, the subjects of it, we do not hesitate to state that the flesh is fitted for food in the early stages of the affection.

The surprise in the continuance of the system of killing and burying bovine animals becomes the greater when we see it adopted in a country where the sale of horseflesh, as an article of food, is both legalised and encouraged by the Government. In Altona, we passed by the shop of one of these horse-butchers, and saw exposed for sale part of the hind-quarters, and sundry pieces of flesh of a horse, and also the liver and kidneys of the animal. We were tempted to walk in, when we were informed by the proprietor that there were four other establishments of the same kind in the town, but that his was "the original one." He said that so ready a sale was found for the meat, that it was with great difficulty he could procure horses enough for his customers. The price ranged from about 2*d.* to 3*d.* per lb. English money, and it appeared that the meat was often bought by persons who could not be properly said to belong to the lower classes. We were invited to see the establishment, and visited the slaughter-house and stable. In the former, besides more meat, was hanging the lower part of the fore leg, with the foot of the animal last slaughtered, which had been put aside for the inspection of the police; and in the latter were standing two aged and worn-out horses, waiting their turn to be led to the stake.

These butcheries are licensed by the Government, and are under the supervision of the police. Notice has to be given before a horse can be killed, when the veterinary surgeon of the department attends and examines the animal, and, if found to be free from constitutional disease, notwithstanding it may be incapacitated for work from lameness or other defect, he certifies to that effect, and for the sake of identity brands the animal on its hoof. Within a given time the animal must be killed, and its leg and foot produced for the inspection and satisfaction of the police.

Sweden and Norway.

We find by a perusal of official documents which have been placed at our disposal, that the fear of the introduction of pleuro-pneumonia from Holstein led the government of Sweden to interdict the importation of cattle from that Duchy in August, 1856, unless accompanied by satisfactory certificates of health. The importation also of cattle from England and Scotland into Sweden was prohibited in the same month. These precautionary measures on the part of Sweden were quickly followed by the promulgation of similar ones by the government of Norway, being in each case evidently founded on the belief that contagion is the chief, if not the only cause of the spread of pleuro-pneumonia.

Lübeck.

From the circumstance that her Majesty's Government, by "the Order in Council" of April 2d, saw fit to prohibit the importation into England "of cattle, horns, hoofs, raw or wet hides or skins of cattle, which shall come from, or shall have been at any place within the territories of the free city of Lübeek," as well as other places named in the said order, it was to be expected that the so-called "steppe murrain" (rinderpest) would be found to be prevailing among the cattle at Lübeck. We were informed, however, immediately on our arrival, that no such disease existed; and subsequently we had ample opportunities of confirming the correctness of this statement. Indeed, rinderpest has never shown itself in the territory of Lübeck since 1813-15, when, by the movement of troops throughout Europe, it prevailed rather extensively here, as also in most countries of the continent.

The precautionary measures which were taken in the spring of 1856, by the Senate of Lübeek, *had especial reference to pleuro-pneumonia*, which disease had somewhat suddenly made its appearance in the adjoining Duchies of Meeklenburg-Schwerin and Mecklenburg-Strelitz. Some doubt, however, was felt in this country as to whether the "steppe-murrain" had not found its way thence from Prussia; and this was considerably added to by the official reports of Mr. J. A. Blackwell, who up to the beginning of the present year was British Vice-Consul at Lübeek.

In two despatches dated respectively May 17th and 30th,

1856, Mr. Blackwell informed her Majesty's Government, through the Consul-General at Hamburg, that a contagious pulmonary disease or murrain had broken out among the cattle in Mecklenburg; and after giving the particulars of the precautionary measures adopted by the Lübeck authorities to prevent its entrance into their territory, he states that he had consulted several of the best German authors on the contagious maladies of cattle, and found that they made a distinction between "rinderpest and pulmonary murrain;" but he adds, "*both are equally contagious and almost equally fatal, and in a sanitary point of view may, in fact, be regarded as identical.*"

Mr. Blackwell next gives, in the despatch of May 30th, an epitome of the works in question, and under the heading of the STEPPE MURRAIN, he says, that it has been calculated that during the last century alone, this murrain carried off 28,000,000 head of cattle in Germany; and in the whole of Europe, including Russia, but exclusive of Siberia and Tartary, upwards of 200,000,000;" and that "*although the disease which has broken out among the horned cattle in Mecklenburg seems to be regarded as the pulmonary murrain, pleuro-pneumonia, it may perhaps be the real steppe murrain, which is now raging in Poland to a fearful extent, notwithstanding the stringent measures that have been adopted by the Russian Government for putting a stop to it.*"

In another despatch dated September 17th, the same gentleman reports that *the murrain* had extended to Holstein, and that in consequence of this the regulations of the Lübeck Government were enforced with regard to that Duchy, as well as Mecklenburg. He concludes this communication by observing that, "*as this highly contagious murrain has spread from the steppes of South Russia, through Poland, Prussia, and Mecklenburg to Holstein, to a district from which the English market is supplied with cattle, I must beg leave to call the attention of her Majesty's Government to my Report of its origin, progress, treatment, symptoms, &c., transmitted on the 30th of May last.*"

These statements could not fail to add to the alarm which was originally felt in this country; and when it is considered that for several months afterwards scarcely a week elapsed without intelligence reaching us that "the cattle murrain" was spreading, the surprise becomes the greater rather than otherwise, that some measures of a preventive nature were not earlier adopted by her Majesty's Government. It is true that the reports from other British consuls did not fully bear out Mr. Blackwell's statements, but still nothing satisfactory could be learned of the true nature of the malady; and up to

the time of the three National Agricultural Societies determining on sending a commission to investigate the subject, the English public were left in a state of much uncertainty and doubt.

In October, 1856, we find that the restrictions against the entrance of cattle into Lübeck from Mecklenburg were removed, as pleuro-pneumonia appeared to have ceased there; but they were again enforced in the February following, as the malady had reappeared in Mecklenburg, and on our arrival they were still in full operation.

The regulations which had been adopted by the Senate to guard against the introduction of contagious diseases are as follows. They have been established for several years, and are only modified from time to time, according to the places in which such diseases are known to prevail.

"1. Every owner of cattle is required, in case any disease should break out among the same, which leaves no doubt of its contagious nature, to separate the diseased from the other cattle.

"*a*. The special symptoms of *lungenseuche* (pleuro-pneumonia) are a husky cough, which is increased, particularly after the cattle have been watered or moved about, less inclination for food, indifference as to chewing the end, dulness of the hair, and its rough appearance in particular places, and fever after these symptoms have continued for some time.

"2. On the appearance of this disease, or even in cases when it is suspected to exist, the owners of cattle are required, under a penalty of a fine of 20 dollars (about £3 10*s*.), to give immediate notice to the chief of the police, or to the bailiff, at Travemunde, who will take the necessary steps to arrest the progress of the disease.

"3. The bringing in of cattle into the Lübeck territory from the Grand Duchies of Mecklenburg-Schwerin and Mecklenburg-Strelitz shall only be permitted when the cattle are accompanied by satisfactory certificates of their being free from disease.

"4. All veterinary surgeons are directed, in case this disease should break out within the Lübeck territory, to adopt the necessary sanitary precautions according to the instructions of the police. The directions of the veterinary surgeons are implicitly to be obeyed under penalty of heavy fines and imprisonment.

"5. Finally, all police-officers, bailiffs, and *gens-d'armes*, are hereby directed to give notice to the respective police-offices in case any horned cattle should be attacked with the pulmonary disease, or even in cases where it is suspected to exist.

"Given at Lübeck, in the Assembly of the Senate, this 14th day of May, 1856.

"(Signed) C. Th. Overbeck, Dr.,
"Secretary."

Besides these measures of precaution, special instructions are issued for the guidance of veterinary surgeons when the disease has entered the territory. These are—

"1. That, on the appearance of pleuro-pneumonia, immediate notice should be given to the police authorities.

"2. That the affected cattle are to be forthwith separated from the healthy, and removed to a distance. If they are put to grass, the meadows must be divided by good fences, and must be at the least five hundred paces distant from any in which other cattle are kept.

"3. That the persons who tend cattle are to be directed to note carefully the feeding and ruminating of the animals, and, on the slightest indication of disturbed health, to have them professionally examined.

"4. That an inspector, duly conversant with disease, is to be specially appointed to attend the sick cattle; and that without his permission no animal is to be returned to those which are healthy.

"5. That all animals which die are to be buried five feet deep, and covered with compact earth; that the burial-places are to be not less distant than eight hundred paces from any road or paths travelled by cattle, and that they are afterwards to be surrounded by a strong fence or a ditch.

"6. That the diseased cattle are only to be driven in particular roads; that the stables in which they were placed when attacked are to be carefully cleaned, and the manure to be covered over with earth.

"7. That none but medical officers are to make *post-mortem* examinations, and these only by permission of the police authorities; and that no part of the carcase is to be taken away or used, with the exception of the skin.

"8. That for the removal of the dead animals special vehicles are to be provided; and these are to be kept in proper places, and not used for any other purpose. Persons attending upon the sick cattle, or coming in contact with them or with the dead, are not to go near healthy animals, and are to take care that all tools or utensils they may have used are properly cleaned.

"9. That no manure or fodder is to be sold from off the infected farm.

"10. That no animal, however slightly affected, is to be killed for food. Great vigilance must be used in respect to this order.

"11. That, after the disappearance of the disease from a commune or farm for a period of *eight* weeks, it is to be considered as being free from the malady; but that for *four* weeks longer the proprietor is not to sell any cattle or other forbidden things from off the place."

It does not appear that any law is in operation to prevent the importation into the territory from Russia or other countries, of skins, horns, hoofs, or tallow; but we were informed by M. Tollhausen, the French Consul, and who was acting also *pro tem.* as British Vice-Consul, that the official returns show that from 6000 to 8000 only of dry hides annually enter the port of Lübeck from Russia, for transit inland; while from Mecklenburg and the surrounding countries 80,000 skins are received. These are mostly either salted or fresh, and as such are too heavy for transit to a distance, besides being otherwise unfitted for such a purpose; they are, therefore, further prepared and dried in Lübeck, and then sent onwards to Belgium, Rhenish Prussia, &c., and up the Rhine even as far as Switzerland.

No exports of cattle take place from Lübeck by means of the shipping, nor are any imported in this manner from the

Baltic or elsewhere, the supply which is needed by the town and territory being sent over the frontier from the surrounding Duchies. Besides this, we could not ascertain that any cattle have ever been shipped for England from any of the Baltic ports. The difficulties attending such a voyage, and the time it would occupy, are sufficient barriers against a trade of this description being carried on, even if no facilities existed for the transit of cattle inland.

Young stock, however, to the amount, it is said, of 50,000 a year, pass through the territory of Lübeck, from Holstein into Mecklenburg, for the supply of the dairies and farms.

These facts cannot fail to be of importance for legislation, if hereafter it should unfortunately be the case that the rinderpest should extend thus far westward, and in a direction from which foreign cattle are shipped for England.

Mecklenburg-Schwerin and Mecklenburg-Strelitz.

It was from these Duchies that some of the earliest accounts reached England respecting "the murrain," the appearance of which promptly led the Senate of Lübeck to interdict the passage of cattle into its territory, unless accompanied with a certificate of their being in a perfect state of health, and created also much anxiety as to whether the malady might not soon extend to our own country. The alarm, however, seems to have arisen out of the circumstance that pleuro-pneumonia, which had occasionally of late years affected the cattle in Mecklenburg, in common with other continental states, showed itself somewhat suddenly in March, 1856, at the village of Great Göruon, near to Sternberg. Its outbreak is attributed to the introduction of some cattle from Bavaria; and it appears that the "court cattle which were in the same stable" were subsequently attacked. After the death of several, the remainder of the animals were killed, and buried entire.

This summary proceeding appears to have arrested the disease in that particular village; but cases are said to have occurred in other parts of the Duchies. The interdict which was laid on the estate of Great Göruon concerning the "export, import, and transit of cattle, immediately on the outbreak of the disease," was not, however, removed until October 1st of the same year, after which time free intercourse was allowed.

On this fact being officially communicated to the authorities at Lübeck, and also that the whole of Mecklenburg

was free from the disease, the Senate removed the restrictions which had been placed in the way of cattle entering its territory; but, as has been stated in that part of this report which specially refers to Lübeck, these were again enforced in February of the present year, in consequence of the reappearance of the disease in the Duchies of Mecklenburg.

On the 24th of December, 1856, the Commissioners of our Customs published an order with regard to a more rigid examination by the Inspectors of Foreign Cattle, "with special reference to a contagious disease called 'murrain,' which has recently broken out amongst the horned cattle of Mecklenburg." Count Bülow, Minister to the Grand Duke of Mecklenburg-Schwerin, complained of this order to Lord Blomfield, her Majesty's Ambassador to the Court of Prussia, and requested that the attention of the Home Government might be directed to it; and Lord Blomfield thereupon sent a despatch to the Earl of Clarendon, to the following effect:

BERLIN, *January* 23, 1857.

"MY LORD,—I have the honour to inclose to your lordship herewith a copy of a communication which I have received from Count Bülow, Minister of his Royal Highness the Grand Duke of Mecklenburg-Schwerin, requesting me to draw the attention of her Majesty's Government to the injurious effects which the publication of the Custom-House order, published in London the 24th December, 1856, respecting the importation of cattle, alleged to be diseased, from the Mecklenburg States, is likely to have on the commerce of the country. Count Bülow states that 'the cattle murrain,' alluded to in this order as now existing in Mecklenburg, has only manifested itself twice, for a short period, during the years 1855, 1856; and that in each case measures of such a stringent nature were taken as effectually arrested the spreading of the disease, insomuch that since the 1st of October last all the measures of precaution that were in force for its prevention have been suspended by the official order to this effect, a copy of which Count Bülow has transmitted to me, and which, in original and translation, I have the honour to forward herewith to your lordship.

"I have, &c.,

"(Signed) BLOMFIELD."

From this and all the additional information which we have collected, it would appear that there was very little cause for danger to be apprehended, and none in so far as our country was concerned, from the state of the health of the cattle of Mecklenburg; the so-called "murrain" being only the affection known as pleuro-pneumonia.

SAXONY.

This kingdom is perfectly free from rinderpest, and has been so for many years. Scarcely any apprehensions are

entertained that the disease would reach Saxony, even if it were to encroach very much more upon the Prussian frontiers of Russia and Poland, or prevail to a far greater extent than it has recently done in Silesia, as the severity with which the preventive laws of those countries is carried out, is viewed as affording all the security which is required.

Eczema epizootica has been somewhat rife of late, and many cases are still to be met with. Pleuro-pneumonia has only existed in a sporadic form in Saxony as also in Central Germany, and it has, therefore, not excited so much of the public attention here as elsewhere. The laws in force with reference to contagious cattle-diseases are almost identical with those which have already been made mention of in this report.

The investigations in Saxony completed our inspection of the chief course of the river Elbe, and showed that all the countries through which it flows were entirely free from the rinderpest, a result equally as satisfactory as that which had previously been ascertained with reference to the Weser.

Prussia.

Finding that the rinderpest had no existence in the countries we had already passed through, we proceeded to Berlin with a view of going to Königsburg, and thence into Courland, as, according to the information we were at present in possession of, it was here that the malady was prevailing to a considerable extent.

Arriving at Berlin, we first called on the professors of the Veterinary School, who, by virtue of their appointments under Government, are always put in possession of the latest information with regard to the existence and extent of contagious diseases among domesticated animals. From them we learned that the entire district we had proposed to visit was now perfectly free from the pest, and that, if it existed anywhere in Prussia, it would probably be found in the neighbourhood of Breslau, in the province of Silesia. They also further informed us that there was but little chance of our being able to study the nature and symptoms of the pest in any part of the Prussian dominions, from the summary proceedings which are invariably had recourse to, for its immediate extirpation, and that for the purpose of seeing the malady in its different stages, we should have to go into Austro-Poland, or some other part of the Austrian empire, where the laws are somewhat less stringent, and not so rigorously enforced as in Prussia. We ascertained also that in all probability, in the event of our succeeding in obtaining

an entrance within the Prussian military cordon, we should not be allowed to repass it in a less period than three weeks, and even then we should most likely have to leave the clothes we had worn behind us, besides having ourselves to undergo a disinfecting progress.

Under these circumstances we sought an interview with Lord Augustus Loftus, her Majesty's *Chargé d'Affaires*, in the absence of Lord Blomfield, minister at Berlin, with a view of obtaining from the Government of Prussia the latest particulars with regard to the location of the malady, and that amount of assistance and protection which we needed for the speedy fulfilment of our mission.

This interview was at once granted, and we were most courteously received by his Lordship, who manifested the liveliest interest in the question, and also expressed his willingness to do all that he could in furtherance of our object. His Lordship explained at some length his views as to the absolute necessity of keeping up a strict *surveillance* over all articles of commerce which were likely to carry the *materies morbi* of the cattle pest, and of the danger which would be incurred in event of its extension, by allowing the importations to go on from the great ports of the Weser and the Elbe; facts which have already been alluded to in the former part of this report. Lord Loftus also dwelt on the amount of danger which might probably arise from the free importation of bones from Russia and the Baltic ports, and instanced a case where an outbreak of the malady was believed to have depended on the conveyance of the bones of an animal dying with the affection into a stable in which other cattle were placed.

His Lordship requested that I would write to him, stating the object of our inquiry and the requirements we needed from the Government. He also promised that he would put himself in immediate communication with Baron Manteuffel, and would likewise write to his Excellency Sir Hamilton Seymour, her Majesty's Ambassador at the Court of Vienna, to procure for us letters of introduction and recommendation to the authorities in the Cracow division of Galicia, in the event of its being found necessary to go thus far to complete our inquiry.

A letter containing his lordship's suggestions was thereupon forwarded to him, and to this I had the honour of receiving the following reply with the subjoined enclosure:

"BERLIN, *April* 23, 1857.

"SIR,—I beg to acknowledge the receipt of your letter of this date.

"I enclose to you herewith a copy of a letter I have addressed to Baron Manteuffel, requesting H. E. to give you a letter of recommendation for the proper authorities at Breslau; and I shall not fail to forward to you without delay H. E.'s reply.

"I shall likewise request Sir H. Seymour to procure for you a similar introduction to the authorities at Cracow, and shall further beg him to forward the reply to your address, Poste restante à Cracovie.

"I have, &c.,

"AUGUSTUS LOFTUS.

"Professor Simonds, *Hotel Victoria, Berlin.*"

(*Enclosure.*)

"BERLN, *ce Avril* 23, 1857.

"MONSIEUR LE BARON,—Le Professor Simonds, Membre du Collège Royal Vétérinaire à Londres, vient d'arriver à Berlin, étant chargé d'étudier sur les lieux la nature et le traitement de l'épizootie qui s'est manifesté en plusieurs endroits sur la frontière de la Prusse et de l'Autriche. Se rendant Samedi prochain dans ce bût à Breslau, et désirant acquérir la protection et l'assistance des autorités Prussiennes, il s'est addressé à moi, me priant de soliciter de V. E. une lettre de recommendation pour S. E. Monsieur le Président Supérieur de la Province de Silésie.

"J'ai donc en recours à l'obligéance si souvent éprouvée de V. E., en la priant de vouloir bien recommander le Professeur Simonds soit à la haute protection du Président Supérieur ou à la beinveillance des autorités compétentes de cette province.

"Je dois avertir V. E. que le Professeur compte quitter Berlin pour cette province Samedi prochain.

"Je profite de cette occasion, &c.,

"(Signé) AUGUSTUS LOFTUS.

"A. S. E. la Baron de Manteuffel."

His Excellency Baron Manteuffel most readily complied with the request thus made, and in the evening of the same day Lord Loftus wrote as follows:

BERLIN, *April* 23, 1857.

"SIR,—Baron Manteuffel has told me that he will forward, or cause to be forwarded, through M. de Raumer, a letter of recommendation for you to the Upper President of the province of Silesia, so that on your arrival at Breslau you may at once announce yourselves to Baron Schleinitz.

"I send herewith the despatch for Mr. Ward, her Majesty's Consul-General at Leipzic, to whom I likewise enclose for you a letter of introduction.

"I am, Sir, &c.,

"AUGUSTUS LOFTUS.

"Professor Simonds, *Hotel Victoria.*"

Being now furnished with all the necessary letters of recommendation, we made our way as quickly as possible into Silesia; and arriving at Breslau, at once reported ourselves to Baron Schleinitz, by whom we were also most courteously received, and who had already prepared for our use a written account of the progress which the disease had made in the spring of the present year in his province.

The Baron met us by somewhat facetiously remarking, "that fortunately for Prussia, but perhaps very unfortunately for us, who had travelled so far to study the nature of the rinderpest, it had no existence just now in Silesia." He traced, however, upon the map the different places where it had recently prevailed near to the Polish frontier, and which he himself had visited. He likewise related several remarkable instances of the highly infectious nature of the disease, and of its conveyance from place to place by *indirect* means of contagion. The following is a translation of the report alluded to:

Report of the Disease which prevailed among the Horned Cattle in the Province of Silesia during the months of March and April, 1857.

"The rinderpest, which in the present year has visited the province of Silesia, has, with one exception, in which the precise manner that the infection was carried to the premises could not be satisfactorily ascertained, been clearly traced to the introduction of two herds of cattle from Galicia, of the Podolian or Hungarian breed, numbering respectively forty-four and thirty-seven. These beasts were purchased by different landowners, and were brought to their several estates in an apparently healthy condition. Some of the animals have remained in health, as, for example, those which were taken to L. Guttentag, in the circle of Lublinitz, and to Blazeiowitz, in the circle of Tost-Gleiwitz, but others of them became the subjects of the disease.

"THE GOVERNMENT DISTRICT OF BRESLAU.

"Eight oxen were brought to the domain or estate of Fürstenau, circle of Neumarkt, and were put into a stable with some other cattle. In a few days the eight oxen fell ill, and, on the disease being recognised as the rinderpest, they were immediately slaughtered. They had, however, already infected the others, and, on several becoming diseased, the whole herd, consisting of twenty-one animals, was likewise slaughtered. On the same estate there were *eighty* cows, but these were living in other sheds, and did not come in contact with the diseased animals; and, moreover in the same village there were upwards of *one hundred cattle-owners*, but the whole of the cattle were preserved by the summary measures had recourse to. The sanitary *cordon* drawn around the estate was removed twelve days since; three weeks having elapsed since the last case, and everything used about the animals being disinfected.

"THE GOVERNMENT DISTRICT OF OPPELN.

"1. Twenty oxen were brought to the estate of Schwieben, in the circle of Tost Gleiwitz, and on their arrival they were distributed to the different stations (farms) of the estate. The disease also broke out among these animals, and, as they sickened, they were removed to a station where only sheep were kept, and here slaughtered. A military *cordon* was also drawn around the place. Notwithstanding this precaution, the disease spread thus:—

"*a. In Schwieben* one ox was attacked, and he, with another with which he was standing, was immediately killed. The further progress of the disease was at once arrested, although there were a hundred and twenty head of other cattle on the estate, and in the village also about a hundred cattle-owners.

"*b. Station Radun.*—An ox which showed premonitory symptoms was immediately killed, together with another that he was standing next to, and, no other cases have occurred.

"*c. Station Wischnitz.*—The appearance of the rinderpest at this station is very remarkable. It appears that either four or six of the Podolian oxen were sent here, and remained for a few days. These animals gave no evidence of being affected: but *twenty* days after their departure one animal of a herd of nineteen that they had been placed with, fell ill with the disease and the whole were forthwith slaughtered.

"2. Estate Ponischowitz. Twenty Podolian oxen came here on the same occasion, and they within a few days gave indications of being affected. Like the others, also, they had been put with other cattle, forty-nine in number. On the occurrence of the outbreak the whole were killed, so that not a single head of cattle was left on the estate. The place was likewise surrounded by a military *cordon;* but while the disease was going on, a carpenter's apprentice employed on the estate, escaped the vigilance of the guards, and went to his father's house, which was distant about two thousand paces. While there he repaired a manger in his father's cow-shed, and also changed the clothes he had worn at Ponischowitz. The rinderpest in consequence of this broke out among his father's cattle. The whole were thereupon killed, and a military *cordon* drawn around the premises. It is now ten days since the animals were slaughtered.

"3. At Slupsho, four of the Podolian oxen sent here were attacked. They were likewise slaughtered, and the further progress of the disease arrested. The *cordon* has been raised here four weeks; the place having been previously disinfected.

"4. At Zawaiz, in the circle of Beuthen, at a totally isolated farm, a case of sudden death occurred to an ox, which the surgeon reported as happening from rinderpest; but there is considerable doubt as to this opinion being correct.

"5. At Wohlau, in the circle of Pless, close to the frontier of Galicia, and into which no cattle had been imported, three cases of the disease occurred, and all at peasants. These animals had come in contact with nine others, and all were consequently killed and a military *cordon* esta-

blished. In this particular instance it was impossible to trace the cause of the introduction of the disease.

"These are all the cases of rinderpest which have recently occurred in the provinces of Silesia, and at the present time not a single suspicious case exists, owing to the means which the government has adopted to arrest its course. No fear need be entertained that the disease will extend from Prussia to the neighbouring countries.

"(Signed) BARON SCHLEINITZ,
"Privy Councillor to his Majesty the King of Prussia, and Upper President of the province of Silesia.

"BRESLAU, *April* 27th, 1857."

It will not be necessary to comment on this report in this place, and more particularly as we shall have hereafter to adduce some remarkable proofs of the contagious nature of the rinderpest. It is right, however, as several parts of Prussia have experienced during the last two years different outbreaks of the malady, and as its extension in this kingdom especially is an object of much practical importance, as thereby a greater risk is incurred of its reaching those countries which are in direct communication with our ports, that as complete a history of these recent visitations should be here given as we have been able to collect.

THE RECENT OUTBREAK OF THE RINDERPEST IN EASTERN EUROPE.

Throughout the late war, the movements of the Russian troops necessarily called for the transit of large numbers of cattle to those places which the army successively occupied; and it appears more than probable that the wide diffusion of the "steppe murrain" which has occurred within the last three years has depended entirely upon this cause.

The ordinary traffic in cattle leads, it is true, to the annual removal of large herds from the steppes; and hence the outbreaks of the rinderpest in those countries which are otherwise free from it can often be traced to the animals which find their way there from the various fairs and markets. No cause, however, is so potent in the spread of the disease as the outbreak of a Russian war; and consequently, whenever circumstances have required the passage of her troops over the frontier, the pest has manifested itself in a far more extensive form.

Thus it is recorded that, "during the Russo-Turkish war in 1827 and 1828, the Russian cattle which were sent for

the supply of the army carried the murrain with them, and that it destroyed no less than 30,000 head of cattle in Hungary, 12,000 in Galicia, and 9000 in Moravia.

Again in 1831, 1832, and 1833, in consequence of the Polish insurrection, the disease committed great ravages in that country, causing considerable distress. At this period it also crossed the Prussian frontier, in the department of Bromberg and, although quickly exterminated, swept away nearly 1000 head of cattle.

In 1849-50, the malady again prevailed to a very great extent in Hungary, its introduction being due, according to the official report of MM. Renault and Imlin, commissioners appointed by the French Government to inquire into the subject, to the passage of the Russian troops from Wallachia by way of Transylvania.

Very shortly also after the army of Russia was sent to occupy the Principalities, rumours of the cattle-plague became current; and we find that as early as 1854, the disease had made considerable progress both in Volhynia and Podolia. From that period nearly down to the present, the malady gradually extended itself, until it reached most of the countries in eastern Europe, and some parts even of Asia Minor. From the Principalities it can be traced in a northerly and westerly direction into Moravia, Galicia, Poland, Prussia, Lithuania, &c.; easterly, into Bessarabia, Southern Russia, and the Crimea; as also into Turkey, and to the southern shore of the Black Sea.

We have not been able to arrive at any correct estimate of the immense losses these several countries sustained in consequence of this visitation; but it has been officially reported that no less than 26,442 head of cattle were destroyed in the Austrian dominions in the year 1856. And Consul-General Mansfield, in a despatch from Warsaw, states that from May 9th, 1856, to the date of his report, March 29th, 1857, twenty thousand beasts had been sacrificed in Poland alone. It has likewise been said that the French army lost in Samsoun, 8000 beasts out of 17,500 in the space of nine months, and that we lost during the same time 4000 out of 10,000 from the pest—facts which may help to convey an idea of the hundreds of thousands which were swept away.

Mr. Radcliffe, M.R.C.S., who lately held a commission in the Ottoman army, reports that, while he was stationed at Sinope, the murrain was developed towards the termination of the spring or early part of the summer of 1855, and that in the month of June it reached its acme. "Scattered cases," he adds, "occurred, however, from time to time until

November, when, about the second or third week of the month, the disease broke out again with great fiereeness, spread rapidly among the cattle in the depôt and in the town, reached a second acme in about the termination of the month, declined during December, and ceased altogether in January, 1856."

Among many others also, Mr. Walton Mayer, V.S. to the "Royal Engineer Field Equipment," who was, during the war, attached to the Land Transport Corps, speaks of the existence of the disease in several parts of Turkey, and in the immediate neighbourhood of Constantinople, in the summer of 1855. Early in the same year, in consequence of a considerable part of both Austrian and Russian Poland having become the seat of the disease, much apprehension was shown lest it should cross the Prussian frontier. To prevent this the Prussian Government took the precaution of sending detachments of troops to all the points of egress below Thorn, with a view of cutting off the communication with the infected localities.

M. V. Schleinitz, President of the department of Bromberg, in the province of Posen, in his official report, says, that "it was in the month of March, 1855, that we were obliged to order the frontier to be closed, which was first effected in pursuance of the directions in section 2 of the law of 1836. In October of the same year we were under the necessity, in consequence of the threatened approach of danger, of putting into force the severer directions of section 3 respecting the closing of the frontier; and when, at the end of that month, intelligence, though not officially confirmed, arrived here regarding the progress of the murrain, we caused the Polish district bordering upon our department to be thoroughly investigated by the veterinary surgeon of our department within a distance of three miles from the boundary of our territory."

"It being then ascertained that the disease was only two miles and a half from our frontier, we determined, at the beginning of November, to close the same still more strictly, according to section 4 of the said law. At the same time we ordered the district commissaries of police to inform the mayors of the different places of the impending calamity, who were not only instructed to exhort the inhabitants of their districts to use the greatest precaution, but also to give immediate notice, per express, to the Councillor of Administration of the district of every suspicious case of disease breaking out among the cattle."

"As a further warning and instruction to the public, we

caused copies of the circular which was issued by the chief magistrate of our province, under the date of 28th January, 1845, to be printed and distributed, to which we annexed a description of the symptoms of the disease, and caused the same to be distributed as a supplement to our official paper ('Gazette'). Besides this we prohibited the attendance of persons at the weekly markets of the towns lying nearest to the threatened boundary with those species of cattle, as well as with other things likely to convey infection, and which the law of 1833 specially enumerates; we likewise ordered establishments to be erected for personal purification in the villages wherein the frontier custom office is established; stationed gendarmes in the villages on our side of the boundary situated nearest the infected Polish districts, and charged the district commissaries in the immediate neighbourhood, under pain of dismissal from office, with the execution of the preventive measures in case the contagion should break out in our territory. We further empowered the Councillors of the Administration of the district to order the district veterinary surgeons to inspect the villages and places on the boundary as often as necessity required, and to watch over the state of the health of the cattle there."

Notwithstanding these precautions were rigorously adopted, the disease crossed the Prussian frontier; and in the latter part of November, 1855, it manifested itself in the circle of Inowraclaw, and shortly afterwards in the circle of Gnesen, near the town of Posen. The official report states, that on this occurrence "general measures were taken for closing the boundaries of the places infected, and special ones for the infected farmyards, by means of sentries posted under the superintendence of gendarmes; quarantine stables were established, superintendents and cattle inspectors appointed, and these persons provided with written instructions and bound by oath to their observance; all trade in cattle was forbidden within a circuit of three miles, all dogs chained up, and every proprietor of cattle within a circuit of two miles from the infected place was bound upon pain of incurring the penalty of sec. 309 of the Criminal Law, to give immediate notice even of the least symptom of disease among his cattle, to the mayor of the place, who had forthwith to inform the Councillor of the Administration of the district by an express messenger of such cases of disease, provided they did not proceed from exterior injuries."

"These measures for prevention and cutting off intercourse were in no instance abandoned before the expiration of the fourth week; and the carcases of the cattle that had died of

the pest, or had been killed in consequence of its appearance in affected districts, no matter whether diseased or healthy, were always, after their skins had been cut in pieces on all parts of the body, buried in pits from six to eight feet deep, each carcase being previously covered with unslackened lime."

At the first the chief execution of these preventive means on the several farms was intrusted to civilians, but very early in the progress of the malady the military was employed. The disease presently began to subside, but despite every precaution occasional cases occurred, so that the department of Bromberg was not entirely freed from it until the beginning of 1856.

The *cordon*, however, on the frontier of Poland was not raised; but on a decline of the disease in that country a removal of the impediments which had been placed in the way of trade was gradually permitted. Individuals who could satisfy the officers of the urgeney of their business—which, however, must not be in connexion with cattle or cattle offal —were, by reason of a certificate from the Councillor of Administration of the distriet, allowed to cross the frontier, through the custom offices, into Poland. Upon similar conditions foot passengers, who must, however, be furnished with only the most neeessary requirements, were likewise permitted to pass into the department of Bromberg from Poland. Nevertheless all individuals crossing the frontier, together with their effects, were required to be disinfected in the establishments erected for that purpose at the boundary custom place, under the superintendence of a gendarme.

Persons travelling post were likewise subject to the same regulations, and spun goods were not allowed to enter.

Early in 1856—namely, in the month of April—the disease also broke out in the department of Breslau, in the province of Silesia. For the particulars of this occurrence we are indebted to Lord Loftus, to whom they were officially communicated by the Prussian Government. The report states that "for forty years the department had been entirely free from the rinder-pest, but that the disease had existed therein during the 'War of Independence.'" "All investigations have failed," it says, "to show the precise manner in which the outbreak occurred; but it appears that the disease came from the circle of Schrimm, in the district of Posen. The means of its extension from the circle of Schrimm are the more obscure, because those persons who might have been the cause of the conveyanee of the infection are interested in not giving correct information. A knowledge of the exist-

ence of the pest only reached the authorities at Breslau after three different circles were more or less affected, which circumstance arose from the want of experience of the district veterinary surgeons, none having had an opportunity of previously seeing the disease. Subsequently, also, about a month elapsed before correct reports were obtained from the Commissioners who were specially appointed for the investigation, arising from the great distances they had to travel, and the difficulties which were in the way of their making *post-mortem* examinations."

"The disease lasted for seven months, and its continuance so long depended in part on the footing it obtained while the investigations were going on, as during this time many animals were inadvertently exposed to the infection, and consequently they had the malady incubated in their systems when the preventive measures were enforced. Another cause of this long duration of the malady is to be found in the difficulties which were experienced in the adoption of the sanitary laws, and the want of zeal on the part of the public in giving effect to them."

"In October, the disease declined in the different circles, and was nearly extirpated; but, about the middle of November, it reappeared in the villages of Braunau and Seitsch, which doubtless depended on a second communication being established between them and some of the still infected farms." The following table shows the number of the places affected, together with the quantity of cattle kept, and the result of the outbreak:

Circle.	*Number of Infected Villages.*	*Number of Infected Farms.*	*Number of Cattle kept in the Villages.*	*Died.*	*Killed.*		*Total Loss.*
					Diseased.	*Healthy.*	
Wohlau . .	5	7	828	5	8	10	23
Steinau . .	4	35	487	97	78	107	282
Guhrau . .	15	77	4213	151	423	187	761
	24	119	5528	253	509	304	1066

The report states, in conclusion, that, "considering the extent of the circles, and the number of cattle kept in them, together with the length of time which elapsed before a correct diagnosis was arrived at, the loss is but a trifling one, and especially when it is compared with the thousands of animals which are sacrificed to the disease in other countries."

Subsequently to the extirpation of the pest from this part of Silesia, in November, 1856, the province continued free until the month of March of the present year, when, as has been explained by the official report which we have previously inserted on the authority of Baron Schleinitz, some villages lying near to the frontier of Galicia were affected by "the introduction of two herds of cattle from that country." It thus appears that Silesia has recently experienced two separate outbreaks, the first during the year 1856, and the second in 1857.

By the extension of the disease northward Lithuania and Courland became affected, the pest showing itself in the latter-named province in the autumn of 1856, and continuing until January, 1857, with an estimated loss of 2000 head of cattle. Throughout the entire year of 1856, in consequence of the steady progress of the disease in Russian Poland, the importation of cattle, skins, bones, hair, &c., was strictly prohibited all along the Russian frontier of Eastern Prussia.

On the occurrence of cases at Kowno and Tauroggen, and particularly at Lansayen and Georgenburg, places near to the frontier in the circle of Tilset, more severe measures were adopted; the driving of cattle along the right bank of the Niemen was interdicted, and all traffic between the countries was suspended. No persons having to do with cattle were allowed to cross; or if so, they had to undergo a quarantine, while mail passengers were fumigated at the borders. In the month of August the authorities in the circle of Gumbinnen were ordered to stop all the cattle and horse fairs which were to be held in the succeeding months of September and October.

By the strictest enforcement of these sanitary regulations this division of Prussia was preserved until the spring of 1857, when the malady crossed the frontier, and showed itself

in the village of Bassnitzkehmen on the 2d of April, and on the following day in the adjoining village of Meldiglaucken. The disease, however, was at once arrested by the establishment of a military cordon, and by the wholesale slaughter of the animals affected, as also of those suspected to be diseased, and the burial of their carcases in quicklime in holes eight feet deep.

It was the immediate arrestation of the pest in this district which induced us, as has been previously observed, to alter our route and to go on to Silesia, instead of into Eastern Prussia and Courland, with a view of studying the nature of the malady.

From the preceding particulars it appears, then, that since the latter part of 1855 the rinderpest has entered the kingdom of Prussia from adjacent countries in three of its different provinces, namely, in November, 1855, in the circle of Inowraclaw, province of Posen; in March, 1857, in the districts of Tost-Gleiwitz and Lubinitz, province of Silesia; and in the following April in the villages of Bassnitzkehmen and Meldiglaucken, province of East Prussia; besides having prevailed for several months in 1856 in other parts of Silesia, coming there from Posen.

Galicia.

Leaving Silesia, we proceeded to Cracow, taking with us letters of recommendation from Baron Schleinitz to Count Clam Martinitz, president of this division of Galicia. Waiting our arrival also, we found at the *poste-restante* a similar communication from Sir G. Hamilton Seymour, her Majesty's Ambassador at Vienna, which was accompanied by the subjoined letter:

"Vienna; *April* 27, 1856.

"Sir,—In compliance with the request made in your behalf by her Majesty's Legation at Berlin, I at once applied to the Minister of the Interior for the facilities of which you stand in need, and have now the pleasure of forwarding to you the enclosed letter of introduction for Count Clam Martinitz, President of the Government of Cracow, who has already received instructions by telegraph to afford you every possible assistance in the prosecution of the inquiries with which you have been entrusted by

the Agricultural Societies of England, Scotland, and Ireland, under the sanction of her Majesty's Government.

"I am, &c.,

"G. H. Seymour.

"*J. B. Simonds, Esq.*"

On calling at the official residence of Count Clam Martinitz, we were immediately admitted to an audience, when, on presenting our letters of recommendation, His Excellency expressed his entire concurrence in the object of our mission, and his readiness to afford us every facility in his power in its accomplishment. He explained that, in his division of Galicia, the malady was fast declining, but in the circle of Neu Sandec, and also of Jaslo, a few cases would probably be met with. He likewise expressed an opinion that we might have to go as far as Lemberg to satisfactorily study the disease, as in that division of the country it prevailed to a much greater extent. In the event of this being found necessary, he kindly promised to furnish us with all necessary letters of introduction to the governor of the Lemberg division of Galicia, as well as to the local authorities of the places we should visit in his own governmental division, and also copies of the official documents relating to the progress of the disease, and the instructions issued by the commissioners of the sanitary laws.

In accordance with this arrangement, in the evening of the same day we had the honour to receive the following letter, with its several enclosures, two of which we here insert, namely, the statistical return of the progress of the disease, and the notice which regulates the proceedings of the sanitary commission.

"30*th April*, 1857.

"Sir,—I have the honour, according to my promise, to send you a letter for the Kreishauptman of Jaslo, and another for Count Gotachowski, at Lemberg. I think it proper to join one more addressed to the Kreishauptman of Tarnow (the place where you are to leave the railroad), in case you should need any assistance relating to your further journey. I send you also the papers we have spoken of.

"I am, &c.,

"Clam Martinitz.

"*J. B. Simonds, Esq.*"

(Enclosure, No 1.)—General Report of the Progress of the Rinderpest in the Government of Cracow, from the 1st to the 15th of April.—*Cracow, 23d April*, 1857.

Circle.	*Names of Villages.*	*Date of the Outbreak.*	*No. of Cattle.*	*No. of infected Farms.*	*Sick on 1st April, 1857.*	*Increase to Apr. 15.*	*Total No. of Sick.*	*Recovered.*	*Died.*	*Killed*	*Remained April 15.*	*Total from the time of the outbreak of the Disease.*			
												Attacked.	*Recovered*	*Died.*	*Killed.*
Sandec.	Starawiés	March 21	940	1	...	...	...	...	...	...	...	26	...	4	22
	Lipowe	„ 21	182	1	...	...	...	...	...	...	...	7	...	7	...
	Rovtoka	April 11	100	1	...	2	2	...	1	...	1	2	...	1	...
	Lossosina-dolnah	March 20	395	1	3	12	15	...	...	15	...	72	3	53	16
	Wronica	„ 20	262	2	4	17	21	...	10	11	...	53	1	41	11
	Paszyn	„ 25	213	1	...	10	10	...	4	6	...	12	...	4	8
	Alt Sandec	„ 31	729	1	...	...	...	...	...	...	...	6	...	2	4
	Tazowsko	„ 20	257	1	...	...	...	...	...	...	...	3	...	1	2
	Zabrzez	„ 20	453	1	2	1	3	1	...	...	2	14	3	8	1
	Kamienica	„ 30	433	1	...	...	...	...	...	...	...	44	...	32	12
	Szczawnica	„ 21	490	2	1	...	1	...	...	...	1	34	4	25	4
	Tylka	„ 20	78	1	...	...	...	...	...	...	...	11	...	10	1
	Florynka	„ 17	190	2	2	3	5	...	4	...	1	21	2	18	...
	Banica	„ 22	50	1	1	...	1	1	...	...	...	9	1	8	...
	Kruzlowa wyz	April 6	425	1	2	...	2	...	...	2	...	4	...	2	2
	Ptaszkowa	„ 3	800	4	10	6	16	...	2	14	...	16	...	2	14
	Bialah-niznia	March 30	258	2	10	...	10	...	...	10	...	11	...	1	10
	Bialawyznia	April 4	586	1	...	1	1	...	..	1	...	1	...	...	1
	Total of 18 villages .	...	6,841	26	35	52	87	2	21	59	5	346	14	212	115

Jaslo.	Trabarna	March 15	67	1	...	4	4	...	3	...	1	9	...	8	...
	Pielgrzymka	„ 16	362	3	4	2	6	...	4	...	2	27	...	25	...
	Czekay	„ 14	103	1	...	...	...	...	...	...	...	6	...	3	3
	Mylarz	„ 23	198	1	...	...	..	...	...	...	...	1	...	1	...
	Foluszo	„ 16	225	1	...	...	...	...	...	...	...	6	...	1	5
	Swialkowa	„ 30	472	1	2	2	4	...	...	3	1	17	2	11	3
	Taworze	„ 27	210	1	...	6	6	...	5	...	1	6	...	5	...
	Turaszuwka	„ 15	350	1	...	...	...	...	...	...	...	7	...	7	...
	Suchodol	„ 30	558	1	1	2	3	...	1	...	2	4	...	2	...
	Szymbak	„ 19	866	1	...	...	...	...	...	...	...	9	...	1	8
	Ropa	„ 29	1,382	1	...	7	7	...	2	5	...	8	...	3	5
	Niecznajowa	„ 28	237	1	1	2	3	...	1	2	...	3	...	1	2
	Grab	„ 15	486	1	1	...	1	1	...	...	...	16	1	12	3
	Zydowskie	„ 19	237	1	5	7	12	...	8	3	1	15	...	11	3
	Lipinki	„ 28	875	1	...	..	...	...	...	...	...	4	...	2	2
	Total of 15 villages	...	6,633	17	14	32	46	1	24	13	8	138	3	93	34
Tarnow.	Dabrówka	March 21	56	1	...	...	...	...	...	...	...	16	...	12	4
	Siemiechów	„ 28	75	1	7	...	7	5	2	...	...	42	6	36	...
	Total of 2 villages	...	138	2	7	...	7	5	2	...	...	58	6	48	4
Wadowice.	Rzyki	March 20	408	1	...	2	2	...	...	2	...	7	...	1	6
	Lipowa	„ 31	92	1	...	8	8	..	3	...	5	8	...	3	...
	Wieprz	„ 29	83	1	...	5	5	...	1	...	4	5	...	1	...
	Ciecina	April 4	46	1	...	1	1	...	...	1	...	2	...	1	1
	Cisiec	„ 9	40	1	...	1	1	...	...	...	1	1	...	...	...
	Total of 5 villages	...	669	5	...	17	17	...	4	3	10	23	...	6	7
Cracow...	Cieszkowice	March 30	300	1	11	...	11	...	2	9	...	11	...	2	9
							TOTAL OF THE WHOLE GOVERNMENT.								
5	41	...	14,574	51	67	101	168	8	53	84	23	576	23	361	169

(Enclosure, No. 2.)

Translation.

"*Circular Notice of the Imperial Royal Government of Galicia respecting the Slaughtering of Cattle to prevent the spreading of the Rinderpest.*

"To prevent the spreading of this disease by the means which are at the command of the Minister of the Interior, it has been deemed expedient to issue the following orders:

"1st. That whenever there are reasons to suspect the existence of the pest, all diseases occurring among cattle shall be carefully watched; and when the least doubt exists as to the nature of the affection, the animal shall be killed, and a *post-mortem* examination made with a view of ascertaining as far as possible the exact nature of its ailment.

"(*a*) The disease having been declared suspicious by a medical officer duly appointed for that purpose; and

"(*b*) The local authorities having been informed by the medical officer of his opinion, they shall jointly proceed to value the animal to be slaughtered, according to the manner hereafter described.

"2d. Slaughtering is to be enforced in the Austrian dominions when the rinderpest already prevails—

"(*a*) At its outbreak in places which have hitherto been free from it.

"(*b*) When the disease is well marked in its characters, symptoms, and duration, or by its violence and destructiveness, and when also the police measures which have been already taken have been without effect in checking its progress, so that there is a probability that either the malady by the slaughtering may be suddenly brought to an end, or that its further spreading may be entirely or partly prevented, to enable the communication between healthy and diseased districts to be speedily re-established.

"(*c*) The ultimate decision as to whether the slaughtering shall be enforced when the certainty of the presence of the rinderpest has been decided on, and to what extent it shall be carried, is to depend on the commissioners who are appointed for that purpose, who, after having been duly informed of the outbreak of the rinderpest or other disease of a suspicious nature, or the spreading of the same in the infected communes, shall, conjointly with those who are charged with the carrying out of the veterinary police regulations, and also, if possible, with a medical officer acquainted with the disease, and two sworn valuers, taken from the commune, who are well acquainted with the price of farm stock, first value the cattle which it has been decided to slaughter. A special report is to be made of the proceedings to the competent authorities.

"3d. With reference to the question by whom and in what manner the estimated value is to be paid to the owner of the condemned cattle, and whether it is ultimately to be paid by an order on the Treasury from the police authority of the district—

"(*a*) The owner will receive the full value ordered by the authorities, after deduction has been made for the parts that may be used, as determined by competent authorities, for the cattle which have been killed on suspicion under rule 1, with a view to ascertain if the disease was the rinderpest or not.

"(*b*) For those cattle where no doubt exists as to the nature of the disease being the rinderpest, and in those districts in the Austrian dominions which are known to be infected. And when the slaughtering shall have been ordered by the authorities, the owner shall only be entitled to

receive the amount of their value on condition that he has not neglected any of the precautions which are prescribed by the veterinary police, and thereby contributed to the spread of the infection among his stock, or has in no way concealed the disease after the outbreak on his premises.

"(*c*) Under the same circumstances of the existence of the disease, the sum named by the valuers, after deducting the worth of the parts allowed to be used, such as the skin and horns, when properly disinfected, will be paid for every head of cattle killed by order of the Commissioners.

"(*d*) With a view to facilitate those proprietors whose cattle have been slaughtered by the commission for the purpose of ascertaining the nature of the disease, and when it has been proved not to be the rinderpest, in replacing their cattle speedily, the district authorities are empowered to order the payment to be made out of the district funds, and to duly inform the superior authorities of the same.

"4. To estimate the true value of the cattle ordered to be slaughtered by the commission, the local authorities, as well as the sworn valuers, will have to take into consideration the market value, age, and breed of every animal submitted to them.

"5. With regard to the cattle which have been killed as suspected animals, but which are found on a *sectio cadaveris* to be perfectly free from the disease, the flesh of the same may be used for food, and the hide, horns, and tallow as articles of commerce. Of those also which were known to be affected by the pest, or were discovered to be diseased on the making of the *post-mortem* examination, the horns, fat, and hides may be used for commercial purposes, but only on the regulations framed for that end being strictly complied with, and it is ordained that in these instances the parts shall be valued and deduction made from the amount to be paid to the proprietors.

"The attention of the local authorities and veterinary police is specially directed to this point.

"Lastly. It is ordered that these fresh directions of the district government upon the necessity of the slaughtering of cattle to prevent the spreading of the rinderpest be in force from the present time.

"*Lemberg, 17th September*, 1850."

Immediately on the receipt of these official documents and our letters of introduction from Count Clam Martinitz, we set forward on our journey to Neu Sandec *via* Bochnia, passing over the great rock-salt formation of Austro-Poland, in company with Professor Nicklas, of the Veterinary School at Munich, whom we had previously met at Berlin, and who had been sent by the authorities of Bavaria on a similar mission to ourselves.

Arriving at Neu Sandec, our first business was to wait upon the President of the department, who referred us to the district physician for the latest particulars relating to the precise location of the disease, as the week's report had not yet reached his office.

It may be as well here to observe that in this part of the Austrian dominions there are no scientifically educated veterinary surgeons; and that from the frequent occurrence of epizootic diseases, both physicians and surgeons are appointed by the Government as inspectors of the health of

cattle, and to act also as Commissioners of veterinary sanitary police during the prevalence of these affections. To fit them for this purpose, they have to make this class of maladies their special study, and subsequently to undergo an examination as a test of their competency.

By the district physician we were placed in communication with M. Carl Zankel, surgeon and commissioner of Alt Sandec, who received instructions to accompany us forthwith to the different places where the disease existed; and to proceed, in the first instance, to a village called Lüdowica, lying at the foot of the high range of the Carpathian mountains, where a case had just occurred, and which it was hoped we might succeed in seeing before the animal was destroyed.

On reaching Lüdowica we were at once admitted within the *cordon*, when we found that this animal, together with nine others which had been exposed to the infection with him, had already been slaughtered and buried. An application was made to have the bodies disinterred, but which for want of due formality was not complied with—Lüdowica, in fact, being outside the circle of Alt Sandec, to which M. Zankel was attached, and we not having with us a *special* order from the President to the authorities of the circle we were now in for the disinterment.

The slaughtering had swept away all the animals in the village which were known to have been exposed to the infectious influence of the disease, and consequently we pressed forward through the mountain passes, which here chiefly consist of the partially dried beds of rivers and streams, to another village, called Zabrzez. It was somewhat singular that at Zabrzez we came upon the identical farm where the malady had first showed itself in this locality, and saw on the premises four of the original steppe oxen by which it had been brought. Three of these had been the subjects of the disease, but had recovered, and the fourth had resisted the contagion throughout, as was believed, because he had before been affected. They were tied up to fatten, and had every appearance of perfect health, having no trace of disease of any kind about them.

Besides these, there were nine other animals on the farm in quarantine, consisting of three oxen, a young bull, and five cows. They also were feeding and looking well. Twelve days had elapsed since the last death; and we learned that should no other case occur, the animals would not be liberated till the completion of the twenty-first day from the time of the last death.

Leaving Zabrzez, we went on to Kamienica, five miles distant, and the head-quarters of the Austrian commission, which had been specially sent to administer the sanitary laws applicable to the rinderpest. The commission was constituted of Dr. Anton Karger and M. Johann Rucki, "Imperial Royal Commissioners of sanitary police for Epizootics," and from them, during our entire stay, we not only experienced all the assistance in their power in furtherance of our inquiry, but likewise the greatest kindness and friendship. We were thus left free to pass, as often as occasion required, between Kamienica and Zabrzez, and so to act in our investigations, both within and without the *cordon*, as scarcely could be anticipated, when the austerity of military discipline in these cases is considered, and which compensated in a great measure for our oat-straw beds and sour rye-bread repasts.

In Kamienica we found two quarantine stations, in one of which seven animals were placed, and in the other nine. Two days prior to our arrival a case had occurred in the first station, and more were daily looked for. The animal in question, a cow, was observed by her owner, late in the evening of Thursday, April 30th, to be out of health. She was reported early on the following morning, and immediately seen by the Commissioners, who at once recognised the pest. She lived till 2 p.m. on Saturday, May 2nd, only surviving the attack about forty-two hours. After the body had been examined—and which has to be done in every instance—it was buried. The skin, however, was allowed to be removed for the owner's use, subsequent to its being disinfected and prepared under the inspection of the proper officers.

At our first visit to these quarantine stations, in company with the Commissioners and Professor Nicklas, and which was late in the afterpart of Monday, May 4th, no indications of disease could be detected in any of the animals—a fact not without some value, as, on our second visit, at 6 a.m. of the following day, an aged cow, one of the seven, exhibited some of the premonitory symptoms of the pest. This case will hereafter be referred to.

According to arrangement, we next proceeded to exhume the animal which had died on Saturday, that we might note for ourselves the several lesions which had been produced by the disease. We found that all the viscera of the chest had been removed, and were lying by the side of the body, and on bringing both these and the carcase to the surface, we were forcibly struck by the circumstance that so little decomposition had taken place, that no unpleasant smell attended

our operations, although the animal had been dead about sixty-five hours. The flesh also was firm, and of a normal colour; the blood, however, was still fluid in the vessels, and of a darker hue than natural. It will not be necessary to give a detailed account of the morbid appearances which were met with in the viscera, and more especially as, in the course of this report, we shall have to describe these *in extenso* as they were observed in several other cases; suffice it therefore to say, that although they left no doubt of the animal having died from the rinderpest, they opened up new ideas in our minds as to the true pathology of the disease.

Before proceeding to a description of the nature and symptoms of the malady, or the relation of individual cases of it, we propose to give in the next place the

History of the Appearance of the Rinderpest in Zabrzez and Kamienica.

Until the present occasion, the villages of Zabrzez and Kamienica, as well as all the surrounding district, have been perfectly free from the disease since 1846.

The existing outbreak took place in the month of March, and was due to the introduction of ten steppe oxen which had been purchased at a cattle fair held at Jaczmirz, in the Lemberg division of Galicia. These oxen came with large droves from Bessarabia, and from three to four thousand head were brought together at the fair. Jaczmirz is about twenty German miles from Zabrzez, and three full days were occupied in driving the animals to the latter-named place.

They were bought by M. Berl Krumholz, farmer and distiller, and arrived at the farm on the 15th of the same month, and, after remaining a few hours, were sent on to Kamienica, where the distillery is situated. They were here put with fourteen fat oxen, but, in consequence of these animals being sold for slaughtering two days afterwards, the steppe cattle were returned to Zabrzez on the 18th. Here they were placed in a stable by themselves, and stood there until the 20th, when four of them were a second time sent to Kamienica, with ten head of young stock, and on their arrival were placed with twenty-one others.

On the following day, the 21st, the six steppe oxen left at Zabrzez were observed to be trembling, which being supposed to depend on exposure to cold, they were put into a shed for warmth, in which were eighteen other animals, consisting of some young bulls, cows, and two calves. On the 22nd, the four steppe oxen at Kamienica were likewise noticed to be unwell and trembling, and, the true nature of their

illness being now suspected, they were immediately removed from the other stock, and orders were sent to Zabrzez for the six to be also taken away and kept by themselves.

As a further security to the stock at Kamienica, early the next morning the four steppe oxen were sent back to the farm at Zabrzez. Notwithstanding this precaution, the disease broke out among the young cattle on the 30th, and eight of them died on the first day; and by April 3rd, thirty-one in all were dead. Besides these animals M. Berl Krumholz had ten others at Kamienica, and the Commissioners decided upon killing them at once, so that he might receive something towards his loss. Thus it appears that the entire number lost by him at Kamienica was forty-one animals; and had it not been for the selling of the fourteen fat oxen, they also in all probability would have been sacrificed to the disease.

On the same day that the pest manifested itself at Kamienica, it also broke out at Zabrzez among the eighteen animals with which the steppe oxen were placed on the 21st. Of the entire twenty-eight animals located here, including the ten steppe cattle, thirteen died, eleven were killed, three recovered, and one resisted the infection entirely. The three animals which recovered, and the one which escaped the attack, were all steppe oxen; they have been previously mentioned as being seen by us on our first visit to the farm.

The establishment, however, of the *cordon* confined the disease entirely to this farm, although there were in the village altogether 453 head of cattle, the greater part of which were very poor and weak animals, badly fed and badly provided for.

The progress of the disease was rather singular at Zabrzez —thus, eleven of the thirteen deaths had occurred by the end of the third day of the outbreak; every one of the animals dying which had up to that time shown symptoms of the disease. On the ninth day subsequent to the death of these, another animal sickened and died, and on the fourteenth day after its attack a second; and in twelve days more a third was taken ill, namely, a young bull, whose case will be hereafter recorded in full, as coming under our own immediate investigation.

Notwithstanding that the same sanitary measures were taken at Kamienica as at Zabrzez, the disease reached the village cattle, but was fortunately prevented making much havoc among them. The ultimate result of the outbreak was that, out of 433 cattle kept in the village, sixty-five were attacked, of which thirty-seven died, and twenty-eight were slaughtered.

In Kamienica the malady chiefly prevailed among the cattle of the small proprietors and peasants; and the daily lamentations of the poor women, to whom was confided the principal care, or rather, on whom was forced the labour of nursing and feeding the animals, at the losses they were sustaining, were most distressing to witness. Nearly the entire means of living of these small farmers depend on the well-being of their cattle; and to see them swept away by such a fatal scourge, could not fail to excite our deepest sympathy. A gloom was cast over the whole village; and fear seemed to be depicted on every countenance, lest the disease should still further extend itself.

As a warning to surrounding places, notice-boards were erected at the different entrances into the village, setting forth, by their Polish and German inscriptions of "ZARAZA NA BYDLO ROGATE," and "HORN-VIEH SEUCHE," that the pest was there, while each fresh place of outbreak was instantly surrounded by the military *cordon*, and all communication effectually cut off.

Besides Zabrzez and Kamienica, two other adjacent villages in the circle of Kroscienko were the seat of the pest—namely, Tilka and Szczawnica. The total number of cattle kept in the former was seventy-eight, out of which eleven were attacked; and of these ten died, and one was slaughtered. In the latter place, 490 were kept, and thirty-four became the subjects of the malady; and of these twenty-five died, four were slaughtered, and five recovered. It has been ascertained that the outbreak also in these instances depended upon the introduction of six steppe oxen, bought at the same fair.

CHARACTERS OF THE DISEASE.

Infection.—Rinderpest properly belongs to that class of diseases which is denominated special or specific, by which we understand that there is either some certain and particular cause which gives origin to them, or that a marked peculiarity attends their progress and results. Affections of this kind most frequently possess the power of extension, by an inherent property of disseminating the *materies morbi* upon which they themselves depend, and which we recognise by the terms infection and contagion. Thus each victim may be viewed as adding new seeds to the malady, by the exhalations arising from its own body; it being a remarkable circumstance that, when the morbific matter has entered the system, it multiplies to an inconceivable extent before it is cast out by the organic functions. The circumstance of

animals, when in health, contracting a disease of the same description as that affecting others with which they are located, is the best proof of the infectious or contagious nature of the malady. The escape of some under the same circumstances may be due to a variety of causes, and offers no satisfactory proof that the disease is non-contagious. For example, all animals are not equally susceptible of being acted on at the same time by the morbific matter; some may, therefore, resist its influence to-day, but in the course of a few days afterwards be susceptible of its action.

The facts which have been given with reference to the various outbreaks of the rinderpest do not require the addition of scientific deductions to establish more firmly the infectious nature of the malady. We believe that it stands second to none in its capability of spreading from animal to animal, *the cattle tribe being alone its victims*. If the malady were one that owned its extension to unexplained causes; if it suddenly showed itself in one part of the Continent and rapidly spread, despite all precautionary measures and without the introduction of diseased animals, to others near to or at a greater distance from its origin; if, in short, it possessed all the characters of an epizootic, then we might have some reason to doubt its infectious nature.

It has been stated, on indisputable authority, that *any* animal which has been exposed to the infection can propagate the disease without itself becoming affected; and that even cattle can do this before they are diseased, in consequence of the *materies morbi* being lodged in the hair which covers their bodies. This is by no means improbable, and the opinion receives support from the circumstance that in numberless instances persons visiting the sick cattle have conveyed the pest to other animals of the ox tribe. Thus we see that in these particulars the disease agrees with the small-pox of sheep, or with the plague, small-pox, &c., of man, and that it is as infectious among cattle as the latter-named diseases are among ourselves.

There have been doubters of the infectious nature of the rinderpest; and whenever speculation has been allowed to take the place of facts, although it may seemingly have had science as its basis, great injury has resulted to those most interested in the question. A notable instance of this kind has been furnished us by Professor Renault, Director of the Alfort Veterinary School, and through his kindness we are enabled to transcribe the following particulars.

"Towards the end of 1844, the rinderpest, which had prevailed among the cattle in Galicia, passed through Moravia,

and made its appearance in Bohemia, in the circle of Königgrätz. The malady had already made some progress in the district, when M. Verner, chief of the Veterinary Department of Bohemia, was sent from Prague by the government to inquire into the precise nature of the affection. This gentleman, who had had many opportunities of seeing the rinderpest, had no difficulty in recognising this disease in the malady in question, and, with a view to arrest its further progress, he recommended to the superior authorities the adoption of those measures which experience had shown to be best calculated not only for this, but to cause its quick extermination; namely, to slaughter the sick animals, isolate those which had been exposed to the contagion, and establish a *cordon* around the infected places. These measures were put in force at once, and soon had the effect of arresting the further progress of the malady, when some young physicians, who had had an opportunity of making, for their instruction, some *post-mortem* examinations of the cattle, thought that they recognised in the affection an analogy to that of the *typhus abdominalis* of man. They therefore communicated their opinion to some members of the faculty of medicine at Prague, who, after making several autopsies, came to the same conclusion. A report was accordingly sent to the Government, setting forth that the malady was not contagious, that it could rise spontaneously amongst the horned cattle of the country by other influences than those of contagion, and that the means which the Government had adopted were not only useless but vexatious. As the faculty had great authority in all sanitary matters, the Government, although it did not entirely remove the restrictive measures, still did not enforce them with its usual rigour; the result of which was that in a few weeks the malady had extended into several other circles of the kingdom, committing such dreadful ravages, that the Austrian government took alarm, and forthwith sent M. Eckel, Director of the Imperial Veterinary Institute, into Bohemia. He at once found that it was the rinderpest, and recommended the rigorous enforcement of the former measures, the result of which was that in six weeks or two months afterwards the malady had entirely disappeared in the kingdom of Bohemia."

Incubation.—Like small-pox, and many other affections common to man and animals, rinderpest lies dormant for a time after the infection has entered the organism. This period is found to vary in different diseases, and also in the same disease at different times, as well as with animals which belong to different zoological classes. It is influenced

by many external circumstances, such as the manner in which the infection is received, the heat of the weather, temperament of the animal, freedom from other diseases, peculiarity of constitution, &c. None of these causes can be said, however, to prevent the outbreak of the malady, although some of them may retard, and others facilitate, its appearance. During the incubative period, the animal gives no indication of ill-health, and only does so when the disease is about to declare itself.

The time that the poison of the rinderpest lies dormant is also found to vary; many animals sickening on the seventh day after exposure, and others not until the thirteenth or fourteenth. Some are said even to pass to the twentieth day before giving evidence of the malady. Such cases are few, and may possibly depend on secondary exposure to the infection rather than on so great a variation in the periods of incubation.

These secondary exposures are not unfrequently entirely overlooked, and especially with such an affection as the rinderpest, the infecting materials of which can be conveyed by indirect as well as by direct means. It must not be forgotten, also, that it is a rule or law belonging to this class of maladies, that if an animal passes over the usual period of incubation, it is secure against an attack, and in order to become the victim of an infection, it must be a second time exposed to the influence of the morbific matter. Direct and well-considered experiments are wanting with regard to the incubation of the pest, and these we had no opportunity of making while on our mission. No doubt, however, should be allowed to remain on a point like this, as on it depends the security to be afforded to every country which is contiguous to the steppes of Russia. Austria, which suffers almost annually from this disease in some parts of her dominions, has an especial interest in the question, and should lose no time in effecting its complete and satisfactory solution. In our opinion Austria should appoint a commission of scientific men, and vest it with some of her absolute power, to conduct experiments and take every necessary means of determining the point in a conclusive manner, for the benefit of other countries as well as herself, and she will then both deserve and receive the thanks of the world.

Spontaneous Origin.—The steppes of Russia are the home of the rinderpest, and here it may be said to hold almost undisputed sway, little being done by the Imperial Government to stay its ravages. Here also, as has been elsewhere stated, it is alone regarded as having a *spontaneous* origin,

but it is very probable that a scientific investigation would show that it spreads only from infection directly or indirectly communicated to the numerous herds of cattle which inhabit these extensive plains.

Doubtless every disease has had its place of origin, and in it there may exist persistent causes which keep alive, so to speak, the curse of sin. Such causes may possibly be found on these vast plains of Russia; and if so, here would be the natural habitation of the pest. Be this as it may, it is certain that in those countries which are contiguous to the steppes the malady has no such origin, and its appearance in them is invariably associated with the *recent* introduction of steppe cattle, and generally in the ordinary course of traffic.

No disease which we have ever studied appears to be governed by such precise laws as this, with regard to the means of its extension; and it is difficult to believe that it should spread by infection alone throughout Europe, and not be subject to the same law in the steppes. Supposing the fact, however, to be as asserted, it is evident that peculiarity of breed is not of the causes on which it depends. Large numbers of steppe cattle are met with out of Russia—and in Galicia we saw many which were used for the purposes of husbandry—and these are never known to be the subjects of the pest, unless brought under the influence of the infection. Besides, the Hungarian, Italian, and steppe cattle are all, from their great similarity, evident descendants of the old Roman ox, and yet it would appear that in but one of these has rinderpest a spontaneous origin. Hungarian cattle are even said to be less susceptible to the disease than the other breeds met with in the Austrian dominions, and to bear up better against it, so that the *per-centage* of deaths among them is much less than among others.

Exertion has been assigned as the cause of the appearance of the malady, but, like breed, this too is powerless with all cattle except those of the steppes. We do not regard, therefore, the fact of the breaking out of the pest among steppe cattle at the end of a journey as a satisfactory proof that the exertion they have undergone is the cause.

When we observe a malady to be capable of being communicated from animal to animal by innumerable means of conveying the *materies morbi;* and when we take into account the varying susceptibility of animals to the immediate action of this matter, and also the further circumstance of its remaining dormant in the system for a fortnight, or possibly a longer time, we see many reasons for withholding our as-

sent, without greater experience in the disease, to the opinion that the pest has a spontaneous origin in the ox of the steppes.

General Symptoms of the Pest.—When the animal sickens, the affection will be recognised by almost continuous spasmodic twitchings of the voluntary muscles of the body, more particularly those of the neck and shoulders, and of the hind quarters. These twitchings are accompanied by tremors, which are more or less generally diffused, and which interrupt the regularity of the spasms, and give to the animal an appearance of suffering from exposure to cold. The coat stares, and the patient stands with its back arched and its legs gathered together under the body, but it does not seem to suffer much acute pain. In the course of a few hours rumination is suspended, and the appetite fails, but water will generally be partaken of almost up to the end.

The temperature of the body is variable, a slightly increased warmth of the skin existing at the beginning of the illness, which soon, however, gives way to chilliness of the surface, and this again to a death-like coldness of the ears, legs, and horns, as the malady advances to a fatal termination. The pulse is scarcely disturbed at first, unless the attack is a severe one; when it quickly rises to 70 or more beats in a minute, but wants tone in its action. In all ordinary cases it becomes gradually more frequent in number, but less in force, and in the latter stages can only be felt at the heart.

The respiration is but very little altered at the commencement; it rarely becomes difficult, and was never painful in any of the cases we witnessed. It sometimes rises to 30 in the minute on the second day. The contractions of the abdominal muscles are often interrupted in their rhythmical action by the spasmodic twitchings, which give a singular motion to the animal's flanks, and has led some observers to speak of a great difficulty of breathing as being invariably present. A discharge comes on early from the nostrils, which has many of the characters of ordinary mucus, but, when carefully examined, will be found to contain flocculi of lymph. A slight cough is also present in some cases; but it cannot be heard except one is near to the patient, when it imparts a singular and almost indescribable sound to the ear.

The expression of the countenance does not denote much acute suffering, and the eyes are without any dull appearance, except in the advanced stages of the malady, when the lids are found to be drooping as in sleep, and the ears to be a little lopped. The vessels of the conjunctival membrane are almost without turgescence; but a discharge in most cases

comes from the eyes, which accumulates in a yellow jelly-like mass at the inner angle, and when examined is likewise found to be composed principally of lymph.

The bowels are but little disturbed at the very beginning of the disease; but the feculent matter, almost unaltered at first in consistency, is soon passed in increased quantity, and in the course of the second day diarrhœa sets in. This diarrhœa is presently followed by dysentery, which continues to the end. The evacuations are not particularly offensive, but they are remarkably fluid, of a dirty yellow colour, and mixed with numerous small flocculi of lymph. Occasionally a little blood stains the evacuations, and tenesmus is also present in some cases. The abdomen becomes much pinched in, and the animal's strength quickly fails him. He now keeps mostly recumbent, and rises very reluctantly. If made to move he staggers, and often falls for want of strength. The spasmodic twitchings now *begin to diminish*, and for some hours before death they have entirely passed off.

A sickly smell attends the patient, but there are no disengagements of gaseous compounds into the areolar tissue, nor any other indications of the decomposition of the tissues which have been spoken of by some writers. In short, the animal dies, apparently, and almost without convulsions, from pure prostration of the vital powers.

In those cases which recover no pustules have been observed as forming on the skin, nor any desquamation of the cuticle or fall of the hair. Nor have any ulcers of the eyes, nostrils, or muzzle, been noticed by us in either extreme or protracted cases.

One of the most favorable indications of a return to health is a less frequent evacuation of fluid from the intestinal canal, and the dejections possessing somewhat of a feculent character. Such animals soon acquire a more lively appearance, look about for some tempting kind of food, and will slowly begin to ruminate. The pulse acquires more tone, the temperature of the body rises, and the respiration becomes natural, but the diarrhœa will not unfrequently continue for seven or eight days.

Duration.—In all cases which tend to a fatal termination, the animals rarely live beyond the fourth day after the symptoms have shown themselves, while very many of them will sink as early as the second day. The greater number, however, die on the third day from the attack. In those which recover, some diminution in the severity of the symptoms usually takes place on the third or fourth day, and if the

patient survives this time, even should the symptoms not abate, it is regarded as a favorable indication of ultimate recovery. The return to perfect health is rarely effected in less than three weeks, but much will depend on the age and constitution of the animal, as likewise on the amount of structural disease in the mucous membranes of the alimentary canal, and not a little also on the care and attention which are given the patient.

Per-centage of Deaths.—If the pest be allowed to take its its natural course for only a few days, it will be found that the deaths not unfrequently number ninety *per cent.* Steppe cattle are, however, said to bear up better against the affection than others, so that about one half of them will sometimes recover. Speaking, however, in general terms of the different breeds of cattle, as well as of the different circumstances under which they are placed, the mortality will be found throughout Europe to range from seventy-five to eighty per cent. Fat animals, and those which are well cared for, are found to bear up very badly against the disease.

Post-mortem Appearances.—The morbid lesions produced by the pest will be found centred in the mucous membranes, which are more or less affected throughout the entire body. Commencing an examination at the mouth, it not unfrequently happens that many of the conical papillæ which stud the body of the tongue will show here and there, at their bases, their vascular and epithelial coverings to be broken up by the ulcerative process. The root of the tongue, fauces, and *velum palati*, are also similarly implicated to a greater or less extent, while their follicles are filled with effused lymph, giving to the parts an appearance as if dotted over with some yellow pigment. Some of the follicles are likewise ulcerated, but the major portion are merely distended with lymph.

The tonsils are in a similar condition ; and when a section is carried through their long diameter, large portions of lymph can be drawn from their ducts, the yellow colour of which, interspersed in lines along the course of these passages, contrasts strongly with the red substance of the organs. Much turgescence of the vessels of the Schneiderian membrane, with points of ulceration and shreds of lymph, are met with, more particularly about the posterior nasal opening, and base of the vomer. These lesions, however, rarely extend beyond the middle portion of the *septum nasi*.

The pharynx presents the same appearance, but the œsophagus is healthy, as is both the rumen and reticulum in most cases. In some few instances the epithelium readily peels from off the inner surface of these stomachs, when the

vessels beneath are found to be turgid with blood. The rumen invariably contains a fair quantity of ingesta in the state usually met with in healthy animals. The omasum is without structural change, or at most its mucous surface presents an analogous condition to that of the rumen and reticulum. The contents of the omasum are frequently so dry and hard that they can be rubbed to powder between the fingers. This has been considered by many Continental pathologists as a peculiarity attaching to this disease, and hence the term *Löser dürre* has been given to the malady. In three consecutive *post-mortem* examinations, as well as in many others, we found that no alteration, either of the omasum or of its contents, existed which was incompatible with perfect health.

The mucous membrane of the abomasum is always highly congested, more especially towards the pylorus; and its follicles are in an analogous state to those of the fauces, *velum*, &c. The duodenum, jejunum, and ileum are similarly affected, but to a greater extent. These intestines often present a bluish aspect on their serous surface, but which is entirely due to the turgescence of the vessels of the mucous membrane, beneath which being seen through the other coats, gives a greater depth of colour to it than natural. Peyer's glands are not invariably diseased, but, like other follicular openings of the digestive canal, they are often covered with layers of lymph, beneath which ulceration is occasionally observed; but more frequently the surface is healthy, although turgid with blood.

The chief ravages of the disease, as we have met with them, are in the large intestines. The blind end of the colon —the cæcum—was, in one case in particular, ulcerated over several inches of its inner surface, that is, numerous small and distinct ulcers existed, which had evidently had their origin in the follicles of the mucous coat. Thin deposits of lymph, varying in size from that of a pea to the end of the finger—scabs, as they have been designated—usually stud the large intestines almost throughout their whole extent. They are of a dirty yellow colour, and adhere with tolerable firmness to the mucous membrane. In some places ulceration is found to be going on in the membrane; in others this destructive process has ceased, and the healing one commenced, and in most no change of structure can be observed. The terminal portion of the rectum is generally implicated to a far less extent

The substance of the liver is healthy; the gall-ducts, however, contain layers of effused lymph; and sometimes to

an amount sufficient to block up the passages. The gall-bladder is filled with bile possessing its ordinary characters, but the inner surface of the bladder is not unfrequently in precisely the same state as the mucous membrane of the large intestines.

The kidneys are healthy, and the urinary and generative systems apparently unaffected.

The larynx is occasionally slightly ulcerated, particularly on the edge of the arytænoid cartilages. No ulceration, however, has been seen by us throughout the whole extent of the windpipe and bronchial tubes; but thin layers of effused lymph lying in close contact with the mucous membrane are almost invariably present. The lungs are healthy, of a normal colour, and often remarkably free from congestion. Their serous membrane is also unaffected.

The heart is healthy, occasionally rather flaccid, and without blood in its cavities. The blood in all the vessels is *fluid*, evidently from loss of its fibrine. It is also darker in colour than ordinary venous blood. The brain and spinal marrow give no evidence of structural change; but an increased quantity of fluid is often found in the ventricles of the brain, and especially in the upper part of the *theca vertebralis*. The flesh is firm, of a good colour, and has but little tendency to pass quickly into decomposition; indeed, we have not unfrequently seen it in a state fitted for food.

Pathology.—It is difficult to speak with certainty of the true nature of the rinderpest, but it is evident that the morbific matter on which it depends, having entered the system through the medium of the organs of respiration, soon acts upon the blood, by converting some of the constituents of that fluid into its own elements; and that, while this process is going on, the animal gives no recognisable indications of being the subject of the malady. This period constitutes the incubative stage of the disease.

The blood, having thus become contaminated, its vitality impaired, and the poison augmented a thousand fold within the organism, the brain and nervous systems, as the centres of sensation and motion, have their normal function necessarily and quickly interfered with, and hence one of the earliest indications of the disease is a spasmodic twitching of the voluntary and other muscles of the body.

The malady has now arrived at a stage when nature makes a bold effort to rid the system of the poison, and in doing this the force of the morbific matter, so to speak, falls with more or less severity on the mucous membranes throughout

the entire body. Effusions of lymph—the fibrine of the blood—take place into the follicles of the mucous membranes, as an effect, perhaps, in part of the overtaxing of these grand excretory organs, and partly because the fibrine itself is charged with the *materies morbi*, and has probably also lost some portion of its vitality, which renders it unfitted to remain in the vessels. Dark-coloured blood, and which remains fluid even after death, from its defibrination, now flows in the vessels; and dysenteric purging also sets in, under which, as a rule, the animal quickly sinks.

If, on the contrary, the *vis vitæ* should be sufficiently powerful to withstand so great an exhausting process, then the poison being cast off, and principally by the digestive canal, the patient slowly rallies, and the functions of the entire organism are gradually restored. Healthy fibrine again supplies the place of that which was lost, so that the blood will now clot when removed from the vessels, and be once more brought into a state to support the vitality of the prostrated organs.

Ulceration of the mucous membranes, commencing in the follicles, may attend these processes, but it is not a necessary pathological condition of the pest. It is rather to be regarded as a sequence depending for its existence on the amount of contamination of the blood, the duration of the disease, and the diminished strength of the vital forces.

In all this we have a great similarity to the pathology of the small-pox, but in that disease the external skin is the principal focus of the malady, while in rinderpest the mucous membranes or internal skin are its chief seat. Small-pox frequently proves fatal before the local symptoms are well established; and so, indeed, does rinderpest, from the great amount of morbific matter with which the system is charged.

Names given to the Disease.—Of all the terms which have been given to this malady, there is none which we are willing to adopt in preference to "RINDERPEST." It is the one which we have employed throughout this report, although it may be thought that it is too general in its application, and deficient also in explicitness, to be selected in preference to others which set forth something of the nature of the disease. The term, nevertheless, explains that the affection is a true *cattle plague;* and, besides this, being the one which is used throughout Germany, it is thoroughly understood in nearly every European state—a fact which gives it a value above many others.

"STEPPE MURRAIN," although this name tends to throw some light on the chief location of the disease, it nevertheless fails to take cognizance even of the kind of animal which is the subject of the malady, and leaves the pathology of it entirely unexplained.

"CONTAGIOUS TYPHUS" is far from being appropriate, notwithstanding that the disease has some characters which are common to the typhus of man. The differences which are observed in the duration, progress, symptoms, and results of the two maladies, are far too numerous and important to warrant the pathologist in the adoption of a *definite* term of this kind, and for this reason we have purposely abstained from employing it.

"LÖSER DÜRRE" is, in our opinion, the most inappropriate of any of the names to which we have alluded. The hardness of the third stomach, or rather of its contents, which the term implies, is not a speciality attaching to the affection. It may often be present in the pest, but it is just as frequently absent. The term directs attention to one particular part of the body as the seat of diseased action, and consequently it often leads to incorrect conclusions. We have seen men of ability, who have been called upon to make *post-mortem* examinations, hesitate to pronounce a decided opinion of the existence of the malady when the third stomach has been found healthy. Hardness or dryness of these contents is common in many other diseases of cattle, and in nearly every instance in which it occurs it is but an effect of suspended function of the third stomach, as the cessation of rumination is of the first.

Treatment.—We have very little to report of a satisfactory description of the medical treatment of the rinderpest. Indeed, no attempts at curing the disease are now made, in consequence of the inutility of all the means which have hitherto been tried, and the greater risk which is incurred of a further extension of the malady by the keeping alive of animals which would otherwise be slaughtered at once. The advancement which has of late years attached to the science of medicine would seem to hold out a hope that remedies may yet be found for this incurable disease. All experiments, however, which may be undertaken for this object would have, we believe, but little chance of success unless they were carried out by, or under the immediate superintendence of the professors of the different veterinary institutions of those countries in which the pest prevails.

No definite plan of treatment can be laid down, except it is that of supporting the fleeting vital powers while nature is attempting to rid the system of the poison, and then endea-

vouring to counteract the ill effects which had resulted from these efforts. Remedies calculated to promote this end must, however, be selected for each particular case, and also be suited to each particular stage of the malady, or no good is likely to follow.

With these few observations on this part of our subject, we shall proceed to give the details in full of several cases of the disease which came under our immediate notice.

Case 1.

Mention has been made, at page 51, of an aged cow, which was observed, on our second visit to the quarantine-stations on May 5th, to be out of health, the symptoms indicating that she was the subject of the malady.

Considering the great fatality and the usually rapid progress of the rinderpest, it is somewhat surprising that its victims should so frequently show such little disturbance to their health at the commencement of the attack. The animal in question was a remarkable instance of this, as well as of the occasional mild character of the disease. The chief indications of illness which she exhibited, when first seen, were tremors of most of the voluntary muscles of the body, but more especially those of the extremities. The *triceps* muscles of the fore-limbs, and the *glutei*, *vasti*, and *triceps* in particular of the hind-limbs, were most affected with these tremblings; besides which a spasmodic jerking of their fasciculi could be detected as coming on at irregular and short intervals. The animal stood with her back arched and legs gathered together under the body. The head was extended, ears lopped, and coat staring. She was remarkably dull, and greatly indisposed to move. Her appetite was impaired, but not lost, as at times she would pick a little fresh grass. Rumination was tardily performed; the action of the bowels unaffected; the breathing natural, and the pulse almost undisturbed. Indeed, had the morning been a cold one—which it was not—nearly the whole of the symptoms that she exhibited might have been ascribed to an exposure to the bleak mountain air.

Towards the after part of the day, the spasmodic contractions of the muscles were more diffuse. The jerking of those situated at the infero-lateral part of the neck was very peculiar, imparting a movement not very dissimilar to the so-called venous pulse. The skin was rather warmer than natural, but the coat was staring, as in the morning. The breathing still continued undisturbed, while a slight but "thick cough" was occasionally heard. The pulse had risen to about 62. It was regular in its action, but beat with somewhat diminished force. There was no injection of the visible mucous membranes present, nor dryness of the muzzle, as seen in active febrile diseases. The Commissioners expressed their decided opinion that this was a true case of the pest, although an unusually mild one, and they therefore gave orders that

the cow should be taken from the others, and placed in a separate shed, temporarily erected with the branches of pine trees for the purpose, so that we might watch the further progress of the disease.

May 6th, 7 a.m.—The symptoms upon the whole have undergone but little change since last evening. The animal takes but little food, and is equally as dull and dispirited. She shows a disposition to drink freely of water, and would take even more than it is desirable to give her.

8 p.m.—No alteration of importance.

7th, 6 a.m.—A change for the worse has come on during the night. The prostration of strength is now considerable, and the animal is down, unable to rise. Neither the pulse nor the breathing has, however, undergone much change, the principal alteration being that the action of the heart is rather weaker. She refuses food. Rumination is suspended, and the bowels are rather irritable,—voiding large quantities of fæces. The twitching of the muscles are yet present, but mostly confined to the shoulders and neck. The cough is more frequent, and a little mucous discharge likewise comes from the nostrils. The conjunctiva is uninjected, but the eyes are somewhat intolerant of light. The general surface of the body is chilly, as are also the legs, ears, and horns.

On visiting the animal in the evening, we found that a slight diarrhœa had set in during the day; that the pulse had risen to 70, and that the prostration of the vital forces was increased. There were, however, but few indications that the attack would terminate fatally, the other symptoms remaining about the same.

8th.—The twitchings of the muscles are scarcely to be observed this morning, as is generally the case in the advanced stages of the malady. The diarrhœa is, however, more copious, but yet not alarming; the pulse is quicker and weaker, and only to be felt at the heart. The breathing has now become somewhat increased, but is neither laboured nor difficult. The body is cold, and the animal lies with a drooping head and closed eyes, as in a state of drowsiness, refusing all food, but showing the same disposition to take water.

The Commissioners explained that they considered there was no chance of the animal's ultimate recovery, although the case would doubtless be a very protracted one. They also said that they had decided to have her killed in the after-part of the day, if we had seen enough of the disease in its mitigated form, that we might institute a *post-mortem* examination. This arrangement met with our concurrence, and especially as other cases had occurred since this cow was attacked, which we were busily engaged in watching the progress of, for by it an opportunity would be afforded of seeing the lesions which were early produced by the malady.

Sectio Cadaveris.—*Respiratory Organs.*—Mucous membrane of the nasal cavities slightly congested, and covered in patches by a small quantity of a yellowish and somewhat viscid discharge. Larynx

healthy; trachea nearly free from injection, but containing some thin shreds of colourless lymph lying in close contact with its lining membrane. Bronchia healthy; lungs perfectly healthy. No effusion into the thorax.

Circulating Organs.—Heart and its vessels healthy. Blood, dark in colour and but partially coagulated, the coagulum being very soft.

Digestive Organs.—Tongue healthy; fauces and velum congested; pharynx and œsophagus healthy. Rumen healthy, containing a fair amount of ingesta. Reticulum and omasum likewise free from structural disease, and no hardness of the contents of the omasum (*löser dürre*). Slight efflorescence of the mucous membrane of the abomasum in patches was present, and nearly throughout the membrane was dotted over with yellowish points, produced by effusions of lymph into its follicles. The contents of the stomach were fluid, in which floated some shreds of lymph. The duodenum, jejunum, and ilium were nearly free from disease, presenting, however, here and there, a similar state of the mucous membrane to that of the abomasum. The cæcum, colon, and rectum were filled with fluid fæces, but their mucous membrane was, on the whole, free from structural change.

Liver healthy in substance; the gall-ducts were, however, enlarged and thickened in their coats from chronic disease associated with depositions of osseous matter. The gall-bladder was filled with bile, and its mucous membrane was likewise affected with effusions of lymph into its follicles analogous to the abomasum and intestines.

Pancreas and Spleen.—Healthy.

Urinary System.—Kidneys, bladder, &c., free from disease.

Nervous System.—The brain, spinal marrow, and their membranes, were healthy, in so far as the structural appearance indicated.

Case 2.

May 6th.—After giving our attention this morning to Case 1, we went over to Zabrzcz to inspect the cattle which we saw at M. Berl Krumholz's farm at the time of our first visit. Here we found that a young bull, two years and a half old, and one of the nine animals referred to at page 50, as still being in quarantine, was the subject of the malady. The animal in question had only been observed to be unwell early this morning, being twelve days subsequent to the death of the last victim. The symptoms now present were spasmodic twitchings of the muscles, more particularly of those of the neck and shoulders. The spasms succeeded each other with great irregularity, but numbered on the average about ten in the minute. They were likewise accompanied with slight shiverings of the entire body. The skin was warm, as were also the legs, horns, and ears. The back was arched, and the animal stood with his legs gathered under the body, but frequently shifted his position as if in pain. His countenance, however, was more animated

than is generally seen in the early stages of the malady. There was a little turgescence of the vessels of the conjunctiva, but no intolerance of light. A slight mucous discharge flowed from the nostrils, and a short, but nearly inaudible cough was present. The breath was sweet, and the respiration scarcely disturbed. The pulse was increased to 80, and had more fulness than is usual in these cases. All desire for food had ceased; rumination was suspended, and the bowels were in a relaxed condition.

6 p.m.—The symptoms are somewhat aggravated. The animal is down, and is more depressed than in the early part of the day. Diarrhœa has set in, and tenesmus is present. The twitching of the muscles is more violent and frequent. The cough is increased, as is the discharge from the nostrils; the pulse, however, remains the same.

7th.—There is no great change in the general character of the symptoms this morning. The diarrhœa is, however, more copious. The pulse is weaker, but its number is not further increased. The breathing is but little altered. The cough is of the same mucous character. The nasal discharge is thicker, and contains shreds of lymph. The eyes are heavy. The animal keeps laid a good deal, and when down appears sleepy. The spasmodic contractions of the abdominal muscles, which at times are considerable, give a peculiar tremor to the whole body, and interrupt the rhythmical action of inspiration and expiration. Pressure on the spine augments these spasms as well as those of the muscles of the neck and limbs. He refuses all food, but takes a little water.

6 p.m.—Except that the animal is weaker, and the alvine evacuations more fluid, there is no change which needs to be specially reported.

8th.—The spasmodic twitchings are less diffused than yesterday, and not so severe. The pulse is, on the contrary, more rapid and so weak as to be felt with very great difficulty excepting at the heart. The respiration is also increased, and now numbers twenty-six in the minute; it is not, however, laboured. The cough, although frequent, is scarcely audible; it has the same mucous character. The muzzle is moist but cold, as are the extremities and horns, while the surface of the body is yet warm. The diarrhœa has passed into dysentery. The evacuations are now of a dirty-yellow colour, and remarkably fluid: they contain flocculi of lymph, and are occasionally streaked with blood, but are not particularly offensive. A sickly smell attends the patient. The eyelids are drooping, and a thick jelly-like mass of a pale straw colour has accumulated at the inner angle of each eye. This mass is evidently composed chiefly of fibrine, but the vessels of the conjunctiva are not turgid with blood. The animal has a greater disposition to keep laid, and often while recumbent turns the head to the side, as if suffering slight abdominal pain.

9th.—The spasmodic twitchings and the diffused tremors are no longer to be recognised. The prostration of strength is very great.

The dysenteric purging continues unabated in severity. Tenesmus is also present, and the evacuations are very offensive. The abdomen is much pinched in. The respiration remains the same in number, but is occasionally accompanied with a nasal blowing-like sound. The discharge from both the nostrils and eyes is augmented in quantity: the eyes, however, still retain their transparency, and the blood-vessels are but slightly injected. The pulse is not weaker than yesterday, but upon the whole a little more distinct. The ears, horns, and extremities are still a little warm. The animal takes a small quantity of water, and appears to be free from any acute pain.*

* The Commissioners decided to-day upon slaughtering the remaining eight animals in the quarantine, as two or three of them were giving indications of approaching illness. They also had in view the raising of the *cordon* at an earlier date than it otherwise could be, supposing the malady was allowed to take its ordinary course; for, as elsewhere stated, it has to be maintained for *twenty-one* days after the death or the killing of the last animal. The chief object in keeping up the *cordon* for this length of time is to prevent the possibility of a fresh outbreak. No newly-purchased cattle are therefore allowed to come on the farm, nor is any labourer, or other person, allowed to leave it. No straw or fodder of any kind is permitted to be removed: in fact, all the details are as rigorously enforced during these three weeks as while the disease exists.

The resolve of the Commissioners afforded us the opportunity of witnessing the form of valuing the cattle *for slaughtering* on the part of Government, their real value being greater than the estimated one. For this purpose a jury of three persons was summoned, consisting of the Burgomaster of the village and two other inhabitants conversant with the worth of cattle. They were not, however, allowed to come within 200 paces of the line of the *cordon*. The non-medical commissioner, M. Rucki, took his seat at a table placed on the line, and being furnished with writing materials, noted every particular of the transaction. The cattle were then brought one by one to within a short distance of the Commissioner, to be inspected by the jury, who asked a great variety of questions relating to their age, breed, and use for feeding, milking, or working purposes; which being satisfactorily answered, they made their award.

		£	*s.*
The first, a young heifer, was valued at about,	in English money	4	0
The second, also a heifer	do.	4	0
The third, a milking cow	do.	7	0
The fourth, a young steer	do.	3	6
The fifth, an older steer	do.	4	18
The sixth, a young bull	do.	4	0
The seventh and eighth, two heifers	do.	8	16
Total		£36	0

The skins of the animals were next valued at eight shillings each for the larger ones, and six shillings the smaller, which sums, we were informed, would be deducted from the gross amount; the proprietor being allowed to dispose of them as he thought fit, after they had under-

10th.—The symptoms are somewhat mitigated this morning, leading to the hope that the animal may possibly rally. The dysenteric purging is diminished in quantity, and the evacuations also are less frequent. The breathing is more tranquil, and the cough more audible. The pulse has sunk to 70, and has an increased tone. Each rising of the artery is accompanied with a peculiar jerking action. The discharge from the nostrils and eyes has not undergone any material change. The extremities and surface of the body are warmer, and the animal is evidently freer from suffering. He lies less; takes freely of water, and shows a little disposition to pick some fresh green clover, a handful of which we gathered for him from an adjacent field.

11th.—Scarcely so well to-day. Some blood is occasionally passed with the alvine evacuations. These are still fluid, have a fœtid smell, are of a pale colour and contain numerous shreds of lymph. The abdomen is more pinched in. The pulse is rather quicker, as is the breathing, the expirations being at times accompanied with a slight grunt. The discharge from the eyes and nostrils is less in quantity, but the cough is more frequent. He has, however, eaten a little clover and drank some water, and stood up at intervals for a longer time than before.

This change in the symptoms made us most desirous of watching the case to its close, but the Commissioners ordered that the animal should be killed forthwith, as they saw no hope of recovery, and were anxious to remove the *cordon*, there being no cattle left on the premises, excepting the Steppe oxen, mentioned as having some weeks since recovered from the pest.

Post-mortem Examination.—On removing the skin, the muscles of the body were found of their usual colour and integrity, and the areolar tissue throughout was likewise free from congestion. Commencing the examination of the internal organs at the nostrils, the Schneiderian membrane was observed to be much congested, more particularly that portion of it which is continued into the *posterior nares*, where it was

gone a disinfecting process, under the immediate superintendence of the Commissioners. This part of the ceremony being ended, the animals were led away to be slaughtered and buried, when the jury were permitted to approach the table to sign their award. One only of the three could write, namely, the Burgomaster, and he received authority to sign for the others. The appearance of these men was certainly picturesque, if not very prepossessing. They were very scantily clad, having on scarcely any clothes except a long coat made of a coarse and thick woollen material of a dirty-white colour, which reached a little below their knees. The Burgomaster did not much differ from his compeers, except that he wore a leathern girdle, furnished with a pocket, around his waist, in which he carried his money, and of which, little as it was, he appeared very proud. Their legs were enveloped in pieces of linen tied on with string, and their feet were protected by roughly-made sandals, having very thin leather soles, being apparently of their own manufacturing.

extensively ulcerated. This ulceration could be traced from thence to the free edge of the *velum palati*. In places it was concealed by a thick layer of lymph, which adhered with tolerable firmness to the membrane beneath. The larynx, trachea, and bronchi were free from disease, as were also the lungs. The heart was healthy. It contained within its ventricles a small quantity of blood, which was *partially coagulated*, the coagulum being very soft.

The tongue was healthy, as was also the pharynx; but the ducts of the tonsils were filled with effused lymph, the surrounding vessels being turgid with blood. The œsophagus, rumen, and reticulum were in a normal condition. The contents of the omasum were rather dry from retention, but no structural change had taken place in the stomach itself. The mucous membrane of the abomasum was slightly ulcerated in small-sized patches here and there, while nearly throughout its follicles were distended with lymph, and more especially towards the pylorus.

The mucous membrane of the small intestines was congested, the bowels themselves containing numerous flocculi of lymph. Several of Peyer's glands were ulcerated. In some, arrestation to this process had taken place, and the healing one had begun. All these glands were covered more or less with a thickish layer of effused lymph. The mucous membrane of the cæcum was extensively ulcerated at the blind end, and throughout the intestines it was thickly beset with scabs of a dirty yellow colour. Many of these scabs—the product of lymph-effusions—covered surfaces in which no disease could be detected. Other of the scabs had ulceration going on beneath them, while under several the healing process had commenced. They varied in size from that of a small pea to the end of the finger. They were also of different forms and thicknesses.

The colon was in a similar condition to the cæcum, as was likewise the rectum to within a few inches of its termination. These intestines contained no fæces, but were filled with a fluid of a yellowish colour in which floated many shreds of lymph. The liver was healthy, but the lining-membrane of the gall-bladder was in a precisely similar condition to that of the large intestines. The kidneys were pallid, but unchanged in structure. The bladder and genital organs were perfectly healthy. The brain and spinal marrow gave no evidence of structural change, but effusion of serous fluid had taken place into the theca-vertebralis.

Case 3.

May 7th.—The animal, a very poor and weak heifer, was reported by the sentinel on night duty at the quarantine in Kamienica, to have been observed early this morning to be giving indications of the disease. The chief symptoms noticed by us on our visit consisted of spasmodic twitchings of the muscles of the neck and extremities in particular, associated with general shiverings of the body at irregular intervals;

pulse 60, having a sharper beat than natural; a loathing of food; suspension of rumination; grinding the teeth; lax and copious fæces; depressed countenance; drooping eyelids; lopped ears; staring coat; arched back, and chilly surface of body. The animal also stood with its legs gathered together under the belly. The respiration was, however, undisturbed; the vessels of the conjunctiva were uninjected, and the muzzle was moist. No tenderness along the course of the spine was evinced on the application of pressure.

At night, with the exception of increased weakness and the passing of liquid fæcal evacuations, there was no material change in the symptoms.

8th.—The pulse now numbers 65, and has lost its sharp beat; the breathing is a little quickened; the diarrhœa has passed into dysentery; the animal's appearance is very dejected; a discharge flows from the nostrils and eyes; the coat is staring; the spasm of the muscles is more intense; the extremities and body are cold, and the prostration of the vital powers is very considerable.

9 p.m.—The pulse has risen to 75, and can be felt only with difficulty in the arteries; the breathing has become very much quicker during the day, and now numbers 24 in the minute; the dysentery is profuse, and tenesmus is likewise present. The other symptoms remain about the same as in the morning.

9th.—The symptoms are all increased in severity, excepting that the tremors have nearly disappeared; the abdomen is much pinched in; small quantities of blood stain the alvine evacuations, which are likewise very fœtid; the pulse is remarkably tremulous, and the respiration is short and quick. The animal will, however, take a little water to drink.

10th.—During this day she struggled on against the disease, but sunk about midnight, being far too weak to rise for several hours before death.

Post-mortem, eight hours after death.—No congestion of the superficial vessels, nor change in the colour of the flesh was observed on the removal of the skin, nor was there much tendency to decomposition of the body. The blood, however, was *fluid*, and of a dark colour in all the large veins. Ulceration had commenced in several places on the dorsum and root of the tongue, especially around the bases of the conical papillæ. The fauces, *velum palati*, pharynx and larynx were also ulcerated here and there in patches of about the size of a shilling; the mucous membrane of the posterior nasal opening was intensely reddened, and studded with yellowish-coloured points from effusions of lymph into its follicles: the ducts of the tonsils were also filled to repletion with lymph. The lining membrane of the windpipe and bronchial tubes was but slightly congested, but in many places it was covered with *layers* of effused lymph. The substance of the lungs was

healthy, as was their serous covering. The heart was rather flaccid: no blood was found in its ventricles.

On opening the abdomen some petechial spots were found on the omentum, but otherwise the serous membrane was free from any vascular injection. The fourth stomach, and also the small intestines, presented a dark-coloured condition of their outer surface, which, however, was ascertained to depend on the congested state of their mucous lining, as seen through the other coats. The first stomach—rumen—was free from disease; but its epithelial lining could be readily peeled off in places, doubtless from changes which had taken place since death. This stomach contained some rather dry ingesta. A similar state of things was met with in both the reticulum and omasum, but no true *löser dürre* existed. The lining membrane of the fourth stomach—abomasum—was intensely reddened throughout, and its follicles crammed with lymph. Effusions of lymph likewise adhered in many places, as scabs of a dirty yellow colour, to the mucous membrane of this stomach.

The duodenum, near to the pylorus, was in a similar state to the fourth stomach, as were likewise the jejunum and ileum in several detached places along their course. Peyer's glands were free from ulceration, and several of them had every appearance of health. The mucous membrane of the large intestines was ulcerated here and there, while in other parts no change of structure could be detected. These intestines contained much mucus mixed with shreds of lymph. The liver was healthy in its substance, and the gall-bladder was filled with a greenish-coloured bile. Its lining membrane was free from disease, but thin bands of lymph could be drawn from out of many of the large biliary ducts. The urinary and genitive organs gave no evidence of disease. The brain and spinal marrow were firm, and presented no structural change. An unusual quantity of fluid, however, existed both in the ventricles of the brain and also in the upper part of the theca vertebralis.

In consequence of the occurrence of this case and of Case No. 1 in the same quarantine station, the Commissioners determined to slaughter the rest of the cattle, consisting of five, preserving only the animal in question for our special purposes. This resolve was taken on May 8th, and was somewhat hastened by the circumstance that all the animals were in very low condition and of little value, being the property of small farmers but one degree superior in position to the peasants. The greatest difficulty also existed in procuring sufficient food for them, and poor women, the wives of the proprietors, could be daily seen standing up to their knees in water in the mountain streams for hours together, with scarcely clothing sufficient to cover their persons, washing couch grass, which they had picked from off the land in order to feed the animals. The step was, doubtless, rendered necessary by the circumstances. It was nevertheless most painful to witness

the lamentations of these poor women on its being carried into execution.

Shortly after the removal and slaughter of the animals, the quarantine station was set on fire, and soon razed to the ground.

Case 4.

On the evening of May 9th, information was brought to the Commissioners that a fresh outbreak of the malady had occurred in the village of Kamienica. On hearing this, we were almost immediately on the spot, and found that a cow, one of five of the herd, was fast *sinking from the disease*. It was evident that she had been ill for at least two or three days, but had not been reported. The Commissioners expressed much dissatisfaction at this, and immediately took possession of all the animals, and sent them off the premises into quarantine. The key of the stable in which the cow had been standing was delivered over to the keeping of the military, and the *cordon* established.

We may here repeat, that if a proprietor conceals the fact of the appearance of the pest among his cattle, or has been in any way instrumental in bringing it among them when it prevails in the locality, the entire loss which he may sustain falls upon himself, the Government refusing to make any allowance even for those that are ordered to be killed by their officers. This course was, therefore, the one adopted in the present instance.

The most marked symptoms shown by the animal in question were—a profuse dysenteric purging; indistinct pulse; rapid breathing; surface of body and limbs cold; eyes sunk in their orbits; discharge of mucus mingled with lymph from the eyes and nostrils; staggering gait, and great prostration of strength. Indeed, on the way to the quarantine station she fell twice, although the distance was not more than three hundred yards. It was also with much difficulty that she was made to rise. In this condition she lingered on for about eight hours, when death put an end to her sufferings.

The principal lesions observed in making the *post-mortem* examination, were—ulcerations at the root of the tongue, with extensive turgescence of all the surrounding vessels; tonsils loaded with effused lymph, and likewise all the follicles of the fauces and contiguous parts. Large shreds of lymph also existed in the windpipe and bronchial tubes. The heart was pale and flaccid. The abomasum was not so much affected as in other cases we have quoted, nor was any portion of either the small or large intestines. Where diseased, however, the lesions of these viscera were precisely similar to those already described. The mucous membrane of the gall-bladder was extensively diseased, but the ducts of the liver were free from deposits of lymph. Excess of fluid existed in the ventricles of the brain and also in the spinal sheath. All the other organs were free from structural change.

Cases 5, 6, 7, 8.

The animals which formed the subjects of these cases were the companions of Case 4. Three of them exhibited the ordinary symptoms which are seen at the commencement of the pest on the morning of May 10th, and the other was taken ill during the next day. The character and progress of the symptoms in the first three were the same as are usually observed, and therefore they do not call for any particular remarks. The opportunity was afforded us of watching these animals during the whole of May 10th, the Commissioners allowing them to be kept for that purpose; but on the following day, as soon as the only remaining animal (Case 8) was attacked, they were all slaughtered. The malady was quickly running its course at this time, and doubtless would have terminated fatally in all the animals within a day or two; indeed, in one of them the symptoms were now so much aggravated, as to convince us that a few hours would suffice for the animal—a cow—to succumb to the pest.

The *post-mortem* examination, which we made in each of these cases, showed that in all essential particulars the morbid changes agreed with those we have already given in detail. Slight differences were observed both in the extent and location of the principal lesions, but these it is unnecessary to describe. Indeed a careful perusal of the cases which we have selected for embodiment in this report will, we hope, sufficiently explain the morbid changes, even to the medical as to the non-medica reader.

Austria.

In our return journey from Galicia we visited Vienna, and went from thence to Munich, Stuttgardt, and Frankfort, with a view of ascertaining, by a personal examination, the state of things in Southern Germany and Rhenish Prussia. In no division of the Austrian dominions, except Galicia, has rinderpest prevailed during the present year: Bohemia, Moravia, and even Hungary have been entirely free from it. The disease existed in several parts of the empire in 1855 and also in the following year, but it was suppressed in the usual manner. It was introduced on that occasion from Bessarabia, whence it appears that it generally comes.

Some anxiety had been felt for fear the malady might be disseminated by the bringing together of animals from different countries at the great Agricultural Exhibition which took place at Vienna, in May of this year (1857); and the directors of the show, early in April, issued a notice, in which they stated "that the cases of disease which had occurred in Moldavia

and Silesia had been confined altogether to the individual animals which had been imported, and that the cattle of the country were free from all murrain." It was further notified, that on the days appointed for the admission of animals for exhibition, the transport to Vienna of *cattle for the slaughter-house* would not be permitted by railroad, and that the conveyance of those intended to be exhibited would be effected in perfectly new waggons.

The extent of the last outbreak in Austria, its duration, &c., will be shown by the following official report. (See Table on the succeeding page.)

REPORT ON THE STATE AND PROGRESS OF THE RINDERPEST IN THE AUSTRIAN EMPIRE IN THE YEARS 1855-6.

Governments.	*Date of the breaking out of the Disease.*	*Date of the receipt of the last Report.*	*Number of cattle in the whole District.*	*The Disease existed in*			*Number of cattle in the affected Villages.*	*Result.*			*Date of the disappearance of the Disease.*	*Remarks.*
				Circles.	*Villages.*	*Farms.*		*Es aped.*	*Deaths.*	*Slaughtered.*		
	1855.	1856.									1856.	
Bakowine	October 3	April 15	8,121	—	16	—	699	332	367	—	April 15	
Cracow	August 29	Jan. 31	11,667	2	23	—	881	70	787	24	Jan. 31	105 in quarantine at the date of the Report
Lemberg	August 29	Nov. 4	79,315	8	200	1,723	8,113	1,679	6,232	97	—	
Ofen	August 20	Nov. 2	49,859	9	85	—	13,335	10,409	2,916	10	—	
Oldenburg	Sept. 5	Jan. 31	8,235	8	21	481	1,981	950	1,006	25	Jan. 31	
Grosswardein...	May 2	Jan. 28	8,632	1	3	8	3,375	2,343	1,030	2	Jan 28	
Pressburg	July 23	Feb. 15	54,246	9	114	4,314	15,760	7,845	7,845	70	Feb. 25	
Katchau.....	July 1	April 8	38,142	6	106	2,926	11,068	6,379	4,575	114	Feb. 28	
Moravia..... .	Sept. 4	Mar. 16	11,568	41	17	507	1,553	230	915	408	March 16	
Upper Austria..	October 29	Jan. 4	636	2	3	3	8	—	2	6	Jan. 4	
	1856.											
Lower Austria .	Feb. 21	Mar. 12	127	1	1	2	11	—	3	8	March 12	
Total	—	—	270,548	87	589	9,964	56,784	30,237	25,678	764	—	

The facts set forth in this report are so explicit, that no comments thereon are required, and as such we proceed to state, that after leaving Austria, we made our way into

Bavaria.

This country, in common with so many others which we had previously visited, has been perfectly free from the rinderpest, since from 1813 to 1815. Its outbreak at that time was referable to the same cause as in Belgium, &c., *namely*, the passage of the Austrian army into France.

Professor Nicklas, of the Munich Veterinary School, who had returned earlier than ourselves from Galicia, informed us that pleuro-pneumonia was the chief epizootic disease which now existed in Bavaria, but that it had not prevailed to any considerable extent of late years. The sanitary laws to limit its spread are similar to those in other countries, being founded on the fact of the contagious nature of the affection. Animals which have recovered from an attack are marked on their horns with the letters L. S., signifying that they have been the subjects of *Lungenseuche*, it being thought that from the partial disorganization of their lungs they may be the means of spreading the disease for several months after their convalescence.

With regard to the rinderpest, the laws are very severe; and through the kindness of Professor Nicklas, we are enabled to give the following details of their provisions:—

"During the continuance of the pest, no cattle, dead or alive, are allowed to be brought across the frontier. Flesh, hides, entrails, horns, hair, and tallow of cattle, and bones—whole or crushed—of any animal, with their hair, wool, or bristles, are also especially prevented crossing by the *cordon;* as are woollen cloths, scutchings of leather, feathers, farmyard manure, hay, clover, straw, and all other description of cattle fodder.

"When the disease occurs on a farm, the affected animals are not removed from the sheds, but the apparently healthy are taken to the quarantine station. Each commune is obliged to provide a station of this description, which is built of wood and divided into two parts, one for the doubtful cases, and the other for the supposed healthy.

"The Commissioners have the power of allowing medical treatment of the animals; but the veterinary surgeon must remain in the quarantine and receive all he requires at the end of a long pole. All churches, schools, and public-houses of the district are closed, so as to prevent the congregating of people together, and remove those inducements which might cause persons to come from the infected farms.

"On the occurrence of illness among cattle from *other* causes as well as the pest, the Commissioners do not, as a rule, approach the animals, but, standing at a distance, and within sight of them, they arrive at a decision as to the nature of the ailment, frequently ordering some

food to be offered as a test of their freedom or otherwise from the malady. In those instances where the Commissioners enter the stable, they are compelled, before leaving, to wash their hands, &c., with vinegar, and have their clothes fumigated with chlorine gas.

"All dogs, cats, rabbits, domestic poultry, pigeons, &c., have to be kept in places of security and close confinement. If the disease exist in a village through which a high-road runs, the course of the road is turned, if possible; but when this is not practicable, then a guard accompanies the several travellers who arrive at the boundaries of the *cordon*, to see that they do not go upon any infected premises. The *cordon* is frequently maintained by the peasants: none, however, are taken for this purpose from an infected village, but the selection is made from contiguous villages or farms where the cattle are healthy.

"As soon as the malady is observed in a commune, notices are sent to all the surrounding places so that precautionary measures may be immediately adopted by the owners of cattle. Each commune has to provide a place for the burial of the animals which die or are slaughtered, and also a waggon and horses to carry them upon: and, on the disease passing away, the waggon is burnt, and the horses are washed with a solution of chlorinated lime. The place of interment is likewise enclosed, and not allowed to be disturbed for several years.

"On an inspection of supposed cases, the animals which give indications of the malady by spasmodic twitchings of the muscles are ordered by the Commissioners to be taken to the burial-ground, where they are killed, and interred with their skins on, these being cut in the usual manner. Occasionally, a special order of the Government permits the removal of the skins, which are then to be subjected to a disinfecting process, under the immediate superintendence of the Commissioners. If only a few cases occur in a large herd of cattle, the Commissioners have the power to suspend the slaughtering of the exposed animals for a few days, in order to watch the result: such animals have a value put upon them, which is paid by the Government. Should no animal fall ill within twenty days from the death or slaughtering of the last case, then the quarantine is raised; but the cattle which have been liberated are not allowed to go near to others until they have been washed with a solution of chlorinated lime. On the discharge of the animals, the quarantine station is razed and burnt.

"The Commissioners have to report day by day every occurrence to the Government, and to give the fullest particulars, even to the names of the persons employed at the *cordon*, and the age, colour, sex, &c., of the cattle in the quarantine. The hay on a farm at the time the pest occurred is not allowed to be used for cattle, but must be consumed by horses and sheep."

Such are the regulations existing in Bavaria; in substance they agree with others which have been previously given, but nevertheless we are of opinion that they should find a place in this report, as several of the details are singularly minute in providing against an extension of the pest. A great difficulty must evidently belong to the carrying out of the requirement respecting the consumption of the hay, and more particularly if the malady should break out in the autumnal period of the year, as then nearly the whole crop would be in

store. This regulation, we believe, has been enforced, because it not unfrequently happens that, in accordance with custom, the whole of the hay of a farm is placed on strong floors above the cattle-sheds, and not put into ricks as in England.

Wurtemburg and the surrounding German States.

We learned from Professor Hering, of the Veterinary School at Stuttgardt, that, like Bavaria and other abjacent kingdoms and states, Wurtemburg had experienced no outbreak of the rinderpest since 1815, and that its existence at that time was also due to the movements of the Austrian army. The regulations of the sanitary police are almost identical with those in force in Bavaria, both with regard to the rinderpest and also pleuro-pneumonia.

Cattle are reared in large numbers in this kingdom, and are fed for the market principally by the sugar-manufacturers, distillers, and brewers. When fat, they are exported for the supply of the French towns, and Paris in particular. With the exception of Swiss cattle, which are imported for the improvement of the native breeds, very few animals are sent into Wurtemburg from any other country.

Rhenish Prussia.

It could hardly have been expected that this province would be found otherwise than perfectly free from the cattle pest: indeed, in our inquiries of veterinary surgeons, it was somewhat singular that we did not meet with one who had even seen a case of the disease.

Our investigations into the extent of the malady may be said to have been here brought to a close, and to have shown among other things, that even should a revival of the export trade in cattle, which has been spoken of in a former part of this report, take place to England through Holland, by means of the Rhine, there would be no risk incurred of introducing the rinderpest thereby, unless circumstances should unfortunately arise, by which it became as rife as it was in the years 1813, -14, and -15.

As the limits which are ordinarily assigned to reports of this description may have possibly been exceeded, we feel that it would not be right to make any additional observations which are not of a practical character, and therefore we shall content ourselves by appending a summary of the facts which have been ascertained by us in the fulfilment of our mission.

Conclusions.

1. That all the countries of Northern and Western Europe from which cattle are exported to England are perfectly free from the Rinderpest; and that the only disease of an Epizootic or destructive nature which prevails therein is the one known to us as Pleuro-pneumonia, which disease has existed here since 1841.

2. That in the greater part of the official despatches and reports which have been forwarded to the Government, and by them transmitted to the Royal Agricultural Society of England, the Rinderpest has been confounded with Pleuro-pneumonia, "Milzbrand," and other destructive maladies to which cattle are liable.

3. That the Rinderpest is a disease which specially belongs to the Steppes of Russia, from which it frequently extends, in the ordinary course of the cattle trade, into Hungary, Austria, Galicia, Poland, &c.

4. That whenever circumstances have arisen which called for the movements of troops, and consequently the transit of large numbers of cattle, in Southern and Eastern Europe, and particularly when Russian troops have crossed the frontier of their territory, the disease has been spread over a far greater extent of country.

5. That the disease which has recently prevailed in Galicia —where it was specially investigated by ourselves—as well as in Poland, Austria, Hungary, the Danubian Provinces, Bessarabia, Turkey, &c., is the true Rinderpest, or Steppe Murrain of Russia.

6. That with the exception of a few places in the kingdom of Prussia and others in Moravia, near to the frontier of Galicia and Poland, the disease in its outbreaks of 1855,-56, and -57, did not extend to any country lying westward of a line drawn from Memel on the Baltic to Trieste on the Gulf of Venice.

7. That, speaking in general terms, Rinderpest has not existed in Central and Western Europe for a period of forty-two years; its great prevalence at that time being due to the war which was being then carried on between the different Continental kingdoms and states.

8. That all the facts connected with the history of its several outbreaks concur in proving that the malady does not spread from country to country as an ordinary epizootic. And that, if it were a disease exclusively belonging to this class, the sanitary measures which are had recourse to throughout Europe would be inefficient in preventing its

extension ; and consequently that in all probability we should long since have been both painfully and practically familiar with it in this country, as hundreds of our cattle would have succumbed to its destructive effects.

9. That it is one of the most infectious maladies of which we have any experience, and that it is capable of being conveyed from animal to animal by persons and various articles of clothing, &c., which have come in contact with the diseased cattle.

10. That the ox tribe is alone susceptible to the disease ; and that the morbific matter on which it depends lies dormant in the system for a period of not less than seven days, and occasionally, according to some Continental authorities, as long as twenty days, before the symptoms declare themselves.

11. That an attack of the disease which has terminated favorably renders the animal insusceptible to a second action of the *materies morbi* which gives origin to the pest.

12. That the deaths often amount to 90 per cent.

13. That the malady is one in which the blood is early, if not primarily, affected ; and that subsequently the mucous membranes throughout the entire body become the principal seat of the morbid changes.

14. That the symptoms are in general well marked and quite characteristic of the affection.

15. That all varieties of medical treatment which have as yet been tried have failed in curing the disease ; the recoveries which take place having for the most part depended on the *vis medicatrix naturæ*.

16. That no fear need be entertained that this destructive pest will reach our shores. Its present great distance from us would, of itself, afford a fair amount of security ; but when we add to this that no cattle find their way from thence, directly or indirectly, to the English market ; and also that in the event of the disease spreading from Galicia, it would have to break through hundreds of military *cordons,* one after the other, before it could possibly reach the *western side* of the German states ; and, moreover, that for years past commerce has been unrestricted with regard to the importation of skins, hides, bones, &c., of cattle from Russia and elsewhere, all alarm, we believe, may cease with reference to its introduction into the British Isles.